

The Ladies Got Flowers, the Men Trophies, At A.S.R.E. Banquet

(1) Mrs. W. M. Timmerman, wife of the General Electric engineer, affixes a gardenia to her evening gown, just before entering the dining room at French Lick Springs hotel to attend the A.S.R.E. dinner dance. (2) Louis S. Morse, York engineer and president of the A.S.R.E. last year, watches activities out on the hotel lawn. (3) Mrs. James Larkin, charming wife of Century Electric Co.'s district manager in the New York area. (4) A. W. Oakley of the Merchants Refrigerating Co., New York, and a former president of the society. (5) Irv Knudson, major-domo of Detroit Lubricator's refrigeration de-

partment and a "regular" at all A.S.R.E. conventions, was runnerup in the golf tournament, and is shown receiving a prize. (6) Dr. W. R. Hainsworth of Servel was another winner in the golf tournament. (7) W. B. Clark of Mullins Mfg. Co., who won the Kelvinator cup, emblematic of the A.S.R.E. handicap golf championship, also won another prize in the form of a brightly colored umbrella. (8) Carl Conkey of Servel won a duffle bag. (9) "Jimmy" Larkin of Century Electric Co. battled his way to the finals of the tennis tournament, and won a tricky "all wave" electric clock for being the runnerup.

Sympathy Strike Shuts Kelvinator Plant

(Concluded from Page 1, Column 5) virtual sit-down strike in protest against the delay.

Workers on the afternoon factory shift declared themselves on strike and took possession of the plant last Thursday (June 10), in what union leaders termed a sympathetic move in support of the office workers' demands. Orville Pake, chairman of the MESA grievance committee in the plant, said the power was shut off at six o'clock on the day of the strike on the order of Walter Bartels, Kelvinator production manager.

Mr. Smith claims that 400 men are occupying the plant in each shift, but that picketing has not been used. He reported that the Fort St. service plant, though unoccupied by strikers, also was shut down.

Electrolux '2 in 1' Deal Worries N.Y. Dealers

(Concluded from Page 1, Column 2) Some dealers are alleging that the utility was offering the combination to apartment house owners in wholesale lots at an installation price of \$85, less 2% for cash, with apartment lessees being offered their choice of either the roaster-grill or the kitchen ventilating fan.

Although the combination offer was advertised in the New York Herald-Tribune, no window posters or other display material announcing it was in evidence in the utility's show windows in the New York area. It was rumored here that the Refrigerator Association of New York, which officially protested the April \$15 offer in an interchange of telegrams between its managing director, Arthur F. Callahan, and E. F. Jaffe, vice president of Consolidated Edison, was planning another strong protest.

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TVA Area Sales Reach All-Time Peak in April

**\$250,000 Total Is 80%
Over March Figures,
4 Times Last April**

CHATTANOOGA, Tenn.—Electric appliance sales in the Tennessee Valley area reached an all-time high in April, totaling \$250,000 to beat by 80% the \$140,000 reported for March, according to reports made to TVA's information department by independent retailers in the territory. Sales in April, 1936, were only \$65,500.

Included in the month's sales were 952 refrigerators, 254 electric ranges, 95 water heaters, 175 washing machines, and 53 water pumps.

Increases in both the number of customers and the average sale per customer were responsible for the sales boom, TVA officials said. Average sale per customer in April was \$10.08, compared with an average of \$6.29 per customer in March and in April of last year.

In average sales per customer, Gibson County Electric Membership Corp. led with \$30.13, with Middle Tennessee Electric Membership Corp. and Colbert county, Ala., second and third with \$28.40 and \$29.80, respectively.

Largest total sales were reported by Florence, Ala., dealers and those in the North Georgia Electric Membership Corp., both of which exceeded \$17,000.

Dealers in Tupelo, Miss., sold more than \$16,000 worth of appliances during April to rural customers of Tombigbee Electric Power Association, and another \$6,700 to customers in the city of Tupelo.

4-Month San Diego Sales Total 2,105

SAN DIEGO, Calif.—Sales of household electric refrigerators in San Diego county during the first four months of this year totaled 2,105 units, according to figures compiled by J. Clark Chamberlain, secretary of the Bureau of Radio and Electrical Appliances of San Diego County, from distributor and dealer reports.

April sales were reported at 789 units, and with several dealers still unreported, the figure is expected to approximate 850 units.

Electric range sales through April were reported at 229 units, with the April report showing 65 sales. Sales of water heaters for the four months totaled 185 units, 30 of which were sold in April.

May Kansas City Area Sales Rise 8 1/2%

KANSAS CITY, Mo.—Sales of electric refrigerators in the Kansas City area during May were 8 1/2% above those for the same month in 1936, according to reports gathered by the Electric & Radio Association of Kansas City.

For the first five months of the year, refrigeration sales were 6 1/2% higher than those for the same period of last year.

May sales, in addition to representing an 8 1/2% gain over figures for May, 1936, were also 40% above sales for the month during 1935. They fell 22% short, however, of equaling sales during May of 1934, when Kansas City's highest refrigeration total was attained.

Comparison of five months' sales this year with those of past years shows 1937 to be 3 1/2% higher than 1935, but 10% below 1934, the record year.

43 Installations Made in Houston During May

HOUSTON—Forty-three installations of air-conditioning equipment were made by dealers in this city during May, according to figures compiled by Houston Light & Power Co.

Largest job sold during the month totaled 60 tons and was installed in the Bluebonnet theater. A 46-ton system was sold to the Rainbow theater, and 40-ton systems were installed in the offices of Continental Can Co. and in Annunciation church. Perfection-Aire and Way equipment led in number of installations for the month, with 11 each, while (Concluded on Page 2, Column 3)

Patron's Daily 10-Block Walk For Shave Proves Worth of Air Conditioning to Barber

AUSTIN, Tex.—When a man walks 10 blocks out of his way during hot weather for a daily shave in a cool barber shop, an air-conditioning system is worth its cost from a comfort as well as a business-pulling standpoint, believes E. W. Anderson, part owner of the Kinsel & Anderson barber shop here.

Installation of air-conditioning equipment has brought tripled business, and eliminated the usual summer slump. Mr. Anderson says. A cool shop means more comfort both for employees and customers. Benefits of the system have fully justified its cost, in his opinion.

G-E Introduces Line of Storage Refrigerators

CLEVELAND—A new line of storage refrigerators for food stores, restaurants, clubs, hotels, institutions, large homes, and other users of large-size refrigeration equipment has been introduced by the commercial refrigeration section of General Electric Co.'s appliance and merchandise department.

Five models are in the new G-E line, ranging in size from 35 to 87 sq. ft. shelf area and powered by the company's "Scotch Giant" condensing unit, mounted in the base of (Concluded on Page 7, Column 1)

Unit Room Conditioner Developed by G-E

BLOOMFIELD, N. J.—A new unit room air conditioner, designed to furnish a high degree of summer comfort in single rooms of a home or office without requiring a water connection, has been developed by the air-conditioning department of General Electric Co.

Known as Type AF-1, the unit has a built-in air-cooled condensing unit. Air from outdoors is brought in through a window duct by a separate fan, to cool the refrigerant in the condenser. After performing this function, it absorbs the moisture condensed by the cooling coils, and is discharged out the window.

The conditioner, designed for comfort cooling applications where cooling, dehumidifying, circulating, ventilating, and filtering are required, is semi-portable and has a cooling rating of about two thirds of a ton. This can be raised to a ton by supplying a small water line, and making minor changes in the mechanism. No drain connection is required under either condition.

With the air-cooled condenser, no water connection is needed, and cooling capacity is about 8,000 B.t.u. an hour. When there is considerable dehumidification from the cooling coils, a slight increase in cooling capacity is possible because the condensate is (Concluded on Page 20, Column 5)

Utility Features Room Cooler as 'Packaged' Item

Personalized Direct-Mail Pieces High Point of St. Louis Promotion

ST. LOUIS—In cooperation with distributors and dealers, Union Electric Light & Power Co. has started an intensive promotion of air-conditioning equipment, with particular stress on the room cooler as a standard "across-the-counter" item that can be sold by any retail outlet that can handle an electric range or refrigerator.

On the theory that "wherever the public buys furnishings or equipment for the home, room coolers can be sold," the utility's 1937 advertising and promotional activity deals with the air-conditioning idea as well as with equipment and merchandise.

Opening the drive is a series of newspaper advertisements with which dealers and distributors are urged to tie in. The advertisements urge prompt action on the part of everyone who wishes to enjoy the (Concluded on Page 15, Column 3)

A.S.H.V.E. to Discuss Summer Cooling

SWAMPSCOTT, Mass.—Problems concerned with the summer cooling phase of air conditioning will occupy the major portion of the technical program at the 1937 semi-annual meeting of American Society of Heating & Ventilating Engineers, to be held in the Ocean House here from Thursday to Saturday of this week.

Business sessions of the convention will be held on the mornings of the three days, leaving the afternoons free for golfing, swimming, or visits to scenic and historical points of interest in this section.

At the opening technical session, papers on the use of pre-cooling (Concluded from Page 1, Column 4)

Executives See Record Room Cooler Sales

DETROIT—The room cooler market is ready for record-breaking expansion this year, report J. K. Knighton and H. M. McGaughey, sales manager and assistant sales manager of Kelvinator's commercial air-conditioning department, after a 14-day tour of distributors and dealers in 24 cities.

During this period, the men reported, they sold three times as many room coolers as the company sold during all of 1936.

Manufacturers Set Up Regulations in Utica

UTICA, N. Y.—Several appliance manufacturers have already put into effect various price and trade-in regulations under the Feld-Crawford act, according to information received from Utica and Mohawk Valley Radio and Appliance Dealers' Association.

Zenith Radio Corp., according to these reports, has come out with contracts incorporating trade-ins, and including a penalty clause which inflicts a \$50 fine for violation.

Trade-in stipulations of Stromberg Carlson Telephone Mfg. Co. also bear a penalty clause. Waters-Genter Co., manufacturer of Toastmaster appliances, has set prices under the new law, and Ansley Radio, who put out the first radio contracts under this law, has taken a definite stand on trade-ins, the association reports.

Strike Settlement Believed Near At Kelvinator

DETROIT, June 22—A tentative agreement was reached today between representatives of Nash-Kelvinator Corp. and Mechanics Educational Society of America, sponsoring union of the sit-down strike which has kept the Kelvinator plant idle since June 10, it was learned late tonight.

This agreement now awaits approval of George Mason, Nash-Kelvinator president, who, according to reports, is returning tonight from an out-of-town trip to join the conference at 9:30 Wednesday morning.

Company and union officials formulated a tentative settlement after several days of negotiation in the offices of Duncan C. McCrea, Wayne county prosecutor, and former Gov. Alex J. Groesbeck, attorney for the company.

Air Conditioning Aids in Transporting 'Iron Lung' Patient from China

CHICAGO—Air conditioning has played a leading role in Frederick Smithe, Jr.'s dramatic struggle for life.

Carrier air-conditioning equipment taken from the vaults of the Sin Hua Bank in Tientsin, China, saved the 26-year-old Chicago youth from the excessive heat and humidity of the Orient as he lay in his "iron lung" in a Peiping, China, hospital after having been stricken by infantile paralysis in the spring of 1936.

Two Carrier portable room coolers installed in a special railroad car protected young Smithe from the heat of the great American desert on his journey home from China.

Another Carrier portable room cooler was installed in the boy's room in Billings Memorial hospital here, and plans are being made to install a unitary system.

League Is Organized By Topeka Dealers

TOPEKA, Kan.—Organization of the Electric League of Topeka, comprising appliance dealers, has been completed here with L. A. Buxton, district manager of the Kansas Power & Light Co., as permanent chairman and R. H. Hill, of Karlan Furniture Co., as secretary.

Purposes of the organization are: To establish a central and responsible body representative of the electrical industry in Topeka.

To promote the sale and use of standard electrical equipment which is fully guaranteed by the manufacturer.

To advise ways and means in terms of service of increasing the value of electrical appliances to customers.

Firms holding charter membership in the organization are:

Crosby Bros., Emahizer-Spielman, Dodge Van Es, Jenkins, Jordan Electric, The Kansas Power & Light Co., Karlan Furniture Co., Kistlers, Marlinton Electric Co., Montgomery Ward, and Sears, Roebuck & Co.

Delco-Frigidaire Salesmen Led by Steinhardt

ALBANY, N. Y.—J. M. Steinhardt, Inc. has received the highest national quota achievement in the sale of Delco-Frigidaire equipment during April.

The rating was based on reports from 47 distributors. Charles B. Bendix is manager of the company's Delco-Frigidaire department.

Specialty Sales Plan Is Needed, Say Dept. Stores

Survey Shows Failure Due to Lack of Specialty Selling; Zimmerman Speaks

By George F. Taubeneck

CHICAGO—"Typical" department stores lose money on their appliance departments. Those which maintain specialty selling organizations to push electrical appliances make money.

At the Monday evening general session of the 1937 mid-year convention of the National Retail Dry Goods Association, these conclusions seemed to be general.

Authority for the statement that "typical" department stores lose money is a N.R.D.G.A. survey, which would indicate that in 1937 the stores which returned the questionnaire (less than 300) averaged 5% losses on their electrical appliance departments.

Herschel Lutes, divisional merchandise manager of the J. L. Hudson Co., Detroit, was chairman of the session; and Thomas P. McGee of Ed Schuster & Co., Inc., Milwaukee, was discussion leader. The two carried on a dialogue, occasionally interspersed with comment from the floor, which indicated that volume achieved through specialty selling insured profits.

One of the most interesting revelations of the meeting was the disclosure that many department stores are making big profits from the financing of appliance time paper. Some executives declared that their stores could well take a loss on the appliance department just to get the profit on the paper they created.

Formal speakers before the session included P. B. Zimmerman, general manager of appliance sales for the General Electric Co., and member of the Nema committee on business developments ("The Department Store's Place in the Promotional Activities of the Electrical Industry"); George E. Whitwell, chairman, National Kitchen Modernizing Bureau ("The Kitchen Modernizing Program and Its Significance to Department Stores"); and J. S. Bartlett, president, Electrical League of Washington ("The Importance of the Electric Leagues to Department Stores").

Manufacturers were criticized by some delegates for establishing "arbitrary retail price schedules." Large buyers like department stores should be consulted before announcing prices, so as to insure adequate mark-ups, it was argued.

Others believed that higher mark-ups will be necessary in the future to take care of trade-in allowances.

A considerable body of opinion was on the side of shorter terms—especially in view of possible inflation—although it was agreed that to forestall competition on this score it would be necessary to secure the cooperation of furniture store and utility associations, and manufacturers.

Combined cost of delivery, installation, and one year's service on an electric refrigerator, N.R.D.G.A. findings show, is 4 1/2% of the retail price.

"Some retailers feel that the boat has sailed; that the big opportunity for appliance selling has passed," began Mr. Zimmerman.

"The answer to that is: Think Nationally."

Going back into the history of the electrical business, Mr. Zimmerman indicated that each great advance of the industry had been preceded by a national cooperative effort.

Two decades ago, he recalled, there was no appliance business. At that time the industry was engaged in selling the idea of electricity.

(Concluded on Page 2, Column 1)

Zimmerman Tells NRDGA Ensemble Sales Are Key to Appliance Selling Success

(Concluded from Page 1, Column 5)

Came then a national house wiring program, with a view toward adding a million homes a year to the power lines. High wired home saturation having been achieved, the industry turned toward appliances; for patrons then looked on electricity as light, rather than service.

Household refrigeration, he pointed out, had little public acceptance at first. Products were not standardized, prices were high. People didn't feel much like paying \$350 or more for a product to replace a \$20 article.

So a national Food Preservation Campaign was inaugurated, to sell the idea that 50° F. was the danger line.

Quantity buying brought price reductions, and now household refrigeration is a big business.

Newest campaign—one to end discouragement of the "ship has sailed" variety—is the Electric Kitchen promotion.

"What would happen," Mr. Zimmerman asked, "if the automotive industry merely sold a chassis—letting the public order odd body parts out of a catalog?"

Appliance manufacturers can cooperate with paint and cabinet makers, with scientists and home economists, to plan unified kitchens which will not only save time, steps, and money, but which will have style.

"Style," averred Mr. Zimmerman, is the greatest word in merchandising.

Relative to the discussion on higher mark-ups, Mr. Zimmerman cautioned that public inertia is the greatest sales resistance.

"We must convince people that we are giving them exceptional values," he declared. "This will be followed by greater volume, and that, in turn, by lower prices."

"As all other energies go up in price, electrical energy will continue to go down in price. And electrical appliances will go up in value."

"No business will grow faster, no business will be bigger, and none will be more profitable."

Mr. Bartlett pointed out that many business men are now becoming

afraid of the word "cooperative," because it has been so overworked as to be abused, and because it has many new connotations they do not like.

"Cooperation in business should rid itself of any semblance to altruism," he insisted. "It should be for profits only."

Tracing the work of a good electrical league, Mr. Bartlett pointed out that it can help extend the selling season, maintain continuity of promotion on "accepted" appliances (utilities usually promote the new ones), clear up bad competitive situations which have resulted in consumer befuddlement or irritation, develop prospect lists, protect members against adverse and unfair legislation, give luncheons for women's clubs, provide a permanent exhibition of products, and conduct cooperative sales training courses.

A new solution to the refrigerator trade-in problem has been suggested in the Electrical League of Washington, Mr. Bartlett said. The league proposes to pay members one half of each trade-in allowance so long as the value allowed does not exceed 10% of the price of the new refrigerator.

After discussing the Kitchen Modernization Program, Mr. Whitwell launched into a defense of public utilities and public utility merchandising.

His company will pay 11 million dollars in taxes this year, he declared. This is equivalent to two thirds of its revenue from residential meters.

"Were the public utilities tax free," he said, "we could undersell any government project current so badly they couldn't stay in the business."

The dealer, he stated, is interested only in the profit from the sale of an appliance; whereas the utility is interested in electrical service, and thus promotes quality and high standards.

There are cold figures, he declared to prove that when utilities stop selling in a given area, sales drop, and dealer volume doesn't gain.

Utilities sell to rural areas which dealers neglect, he averred.

Air-Conditioning Installations Totaling 318.6 Tons Made in Houston in May

(Concluded from Page 1, Column 2)

Equipment sold by Straus-Frank was used in eight systems sold during the period. General Electric equipment went into five systems, and

York equipment into three.

Following is a tabulated list of installations made during the month, together with type of equipment used and tonnage of individual jobs:

Installation	Type Equipment	Tons
Annunciation Church	Robison-Kiesling	40.0
Roy Kiesling (Residence)	Robison-Kiesling	10.0
Albert A. Bath	Kelvinator	1.0
J. O. Mack	Kelvinator	1.0
Majestic Grill	Straus-Frank	12.0
H. J. Bremer	Straus-Frank	0.7
Dave Rittle	Straus-Frank	0.7
Ben Wolfman	Straus-Frank	0.7
Mrs. Underwood Nazro	Straus-Frank	1.4
Savoicio	Straus-Frank	0.7
Houston Trunk	Straus-Frank	12.0
R. D. Straus	Straus-Frank	0.8
L. M. Robertson	Perfection-Aire Cond. Co.	6.0
Dr. Dan Scott	Perfection-Aire	4.0
Dr. Homer E. Prince	Perfection-Aire	0.6
Dr. Harris	Perfection-Aire	0.6
J. L. Berlowitz Co.	Perfection-Aire	0.6
Mr. Elkinson	Perfection-Aire	0.6
Ryan Flower Shop	Perfection-Aire	0.8
Doctors Clearing House	Perfection-Aire	0.6
Alan Robinson	Perfection-Aire	0.6
Baughill Cafe	Perfection-Aire	6.0
Parkersburg Rig & Reel Co.	York	2.5
Madingo	York	4.0
Standard Oil Field Supply	York	6.5
Dr. Henry Marech	Way	8.0
Cameron Iron Works	Way	2.7
San Jacinto Finance Co.	Way	5.3
Bluebonnet Theater	Way	60.0
Carl M. Knapp	Way	5.3
Black Bros.	Way	5.3
Hill Barber Shop	Way	2.6
Roulande Studio	Way	2.6
Maye's Beauty Shoppe	Way	2.6
Milton Underwood & Co.	Way	5.3
Rainbow Theater	Way	46.0
Vogue Slipper Shop	Way	0.6
W. M. Rice	General Electric	10.0
Continental Can Co.	General Electric	40.0
Houston Natural Gas	General Electric	0.8
Central Drug Store (Galveston)	General Electric	6.0
Associated South Tel. Co. (Baytown)	General Electric	0.5

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But the real miracle lies in the production of a refrigerant that answers perfectly the three demands of proper air-conditioning . . . that is clean, pure, and, above all, *absolutely dry*. EXTRA DRY ESOTOO and V-METH-L are recognized as leaders in these qualities by refrigeration engineers everywhere, and they are available everywhere from ample stocks maintained at all important distributing points throughout the world.

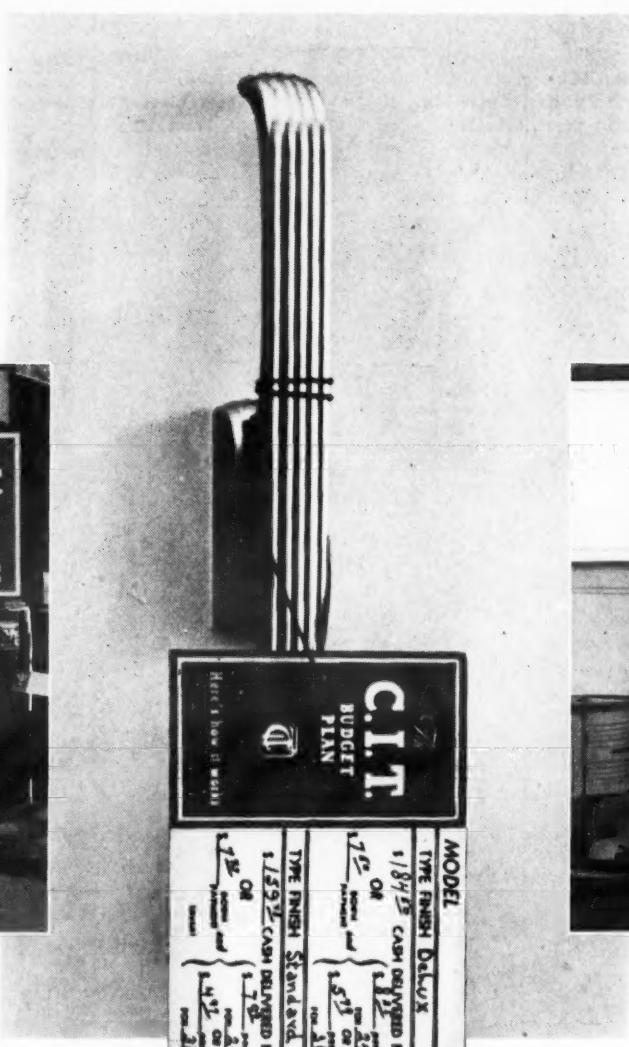
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Here a dealer uses the C.I.T. Budget Plan to immediately suggest a convenient way by which the housewife can acquire new kitchen equipment.

C.I.T.—a name known to millions!
C.I.T.—a sales builder for you!

In nearly 30 years of leadership in financing instalment sales C.I.T. has won the confidence of millions. The fair terms and "open-and-above-board" rate structure of the C.I.T. Budget Plan make an attractive selling point. In store windows the red and white C.I.T. poster is a familiar sight. To the buyer it assures tactful service backed by the experience and resources of the

largest independent finance company in the world. There are more than 165 C.I.T. branch offices in the United States—one in every important trading area. Each of these is a complete operating unit, expertly staffed to give quick, efficient service. National advertising keeps the name of C.I.T. before the public. **PUT C.I.T. TO WORK TO BOOST YOUR SALES!**



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PROFITABLE SALES IDEAS

Window Map of Refrigerator Sales Is Profit-Getter for Fulton Dealer

FULTON, Mo.—Harry Ryan, of Backer Bros.' Westinghouse dealership, has literally put selling "on the map." In fact, he has put it on three maps, and all are maps of this little town of 6,000 inhabitants.

Largest of these maps is located in the store's show window and is dotted with red-headed pins showing the location of all Fulton homes having Westinghouse electric refrigerators. Adjoining signs tell passers-by what the map is all about.

The second map is a somewhat smaller reproduction of the first, and is located on the wall of the sales-room.

The third map, covered with red ink dots instead of red pins, is the one which Mr. Ryan folds up and takes with him whenever he makes a call.

Basis of Mr. Ryan's sales scheme is the theory that nearly everyone (especially in a town of this size)

is interested in what his friends and neighbors do and have. And he believes that sales resistance is materially lessened if you can show a prospect that the family next door and the folks across the street already have the same product that you are trying to sell him.

It's the old, old story of "keeping up with the Joneses," and Mr. Ryan has found that even the gossip of the town's housewives brings him a sale.

To test the amount of attention attracted by his window map, Mr. Ryan once left out a few pins. Immediately, he says, the slighted Westinghouse owners roared into the store demanding that they be represented on the map. So Mr. Ryan simply apologized profusely and put the pins up in the owners' presence.

Mr. Ryan has a great and abiding faith in his maps, and credits them with fully half of the 20 sales he has made this season.

Home Demonstrations, 5-Day Trials Feature 6-Month Campaign Netting 319 Sales

WAYNESBORO, Ga.—House-to-house canvassing, conducting demonstrations in prospect's homes, installing refrigerators on a five-day trial basis, and using direct mail promotions, were among the methods by which the J. L. Timmons & Co., refrigeration and hardware dealer here, sold 319 refrigerators during a six-months drive which ended recently.

Before starting the drive, the company hired two extra salesmen to do house-to-house canvassing. At their first contact calls, the men tried whenever possible to arrange to demonstrate the refrigerator in the prospect's home within six to 10 days.

When prospects could not be sold after the demonstration was made, the salesmen allowed them to keep the refrigerator for a five-day trial period. Each day salesman would call back to see if the prospect were using his refrigerator properly.

Of the 175 refrigerators placed in homes on a trial basis during the drive, only 37 were returned to the store.

Special mailing pieces announcing

**Light—
Compact—
Comfortable**



**CESCO
HEALTHGUARD
FUME KIT**

When refrigeration servicemen go out on jobs there is never any assurance that they won't encounter fumes. As far as respiratory organs and eyes are concerned, there is no "mild" concentration of any refrigerant. Where there is a leak there should be a mask. CESCO HEALTHGUARD FUME KIT overcomes most men's reluctance to the use of a mask because it is made for this particular work—light, easy to carry, put on or off in one motion and comfortable to wear. Interchangeable cartridges for ammonia, methyl chloride and sulphur dioxide. Write for prices.

**CHICAGO EYE SHIELD CO.
2352 Warren Blvd. CHICAGO, ILLINOIS**

the drive were sent to the prospects 10 days before the beginning of the sale. These were followed by additional mailing pieces sent at 15-day intervals.

In dealing with customers who stated that they already had refrigerators, the salesmen played up the economy of owning a new 1937 refrigerator, and estimated how much the prospect would be given as trade-in allowance.

The user plan put into effect during the drive accounted for a substantial number of sales. Each customer who purchased a refrigerator during the first four months of the campaign was offered a \$5 discount on his merchandise in return for each prospect name he turned in upon which a deal was closed.

The company plans to start another selling campaign about July 1.

**Specify
ANSUL
REFRIGERANTS**

*high Quality
better performance*

Complete refrigeration satisfaction depends to a large degree upon the quality and performance of the refrigerants used. If you will specify **ANSUL SULPHUR DIOXIDE** and **ANSUL METHYL CHLORIDE** your satisfaction is guaranteed. Every cylinder is given an individual analysis to make certain that the contents are perfect for refrigeration purposes. Write today for complete specifications, prices and the location of the warehouse nearest you.

**ANSUL
CHEMICAL COMPANY
MARINETTE WISCONSIN**

'Home Counselor' Saves Service Calls

SEATTLE—To promote customer satisfaction and reduce service calls at the same time the home appliance department of Frederick & Nelson sends out a woman known as its "home counselor" to follow up sales of major home appliances with non-selling, friendly calls."

Duties of this counselor are to help the new appliance owner use new equipment properly and to the fullest advantage. During hot weather, for example, the new refrigerator owner is shown how to make frozen desserts.

Because of advice thus given on the proper use and care of appliances, it is claimed, operation failures are fewer and many service calls saved.

9 Dealers Cooperate to Promote New Models

NEWPORT NEWS, Va.—Nine mechanical refrigeration dealers cooperated in promoting new models through a double-page advertisement in the Times-Herald here.

Participating dealers were:

Philip Levy & Co., Kelvinator and Crosley; Sealey & Silk, Inc., Frigidaire; Greene Furniture Co., Stewart-Warner; Parker & Spencer, Fairbanks-Morse; Benjamin Fisch, Copeland and F-M; Home Heating Co., Frigidaire; Nachman's, Westinghouse; Spiegel Bros., F-M; Sears, Roebuck & Co., Coldspot.

Grein Bros. Cultivates Market of Cash-Paying Farmers

NORTH VERNON, Ind.—Cash in the till, and much of it from farmers. That's the agreeable position in which Grein Bros. (three of them) find themselves in today.

For 10 years Grein Bros. have sold Frigidaire. Recently they added Electrolux kerosene units. So far this year they have sold five all-fired Electrolux boxes—four of them for cash.

When a farmer planks out \$285 cash for a new refrigerator, that's news. Grein Bros. know of several more who are going to do just that.

North Vernon, which has a population of perhaps 3,000, is already moderately well saturated with electric refrigerators (General Electric, Norge, and Crosley are also in the running there). But Grein Bros. have sold eight Frigidaires so far this season in the town, and this week will send a truck into Indianapolis for another load.

The adjacent town of Vernon has only 500 inhabitants. North Vernon has attained its larger size because in its center the Pennsylvania, B. & O., and New York Central lines make a triangular crossing.

Harry Grein, one of the brothers, is an old railroad man; and has had especial success in selling to the families of railroaders there.

Recently he has been doing extra work on the rehabilitation of the B. & O. tracks, which took quite a bumping from the Ohio river flood. (The flood did not reach North Vernon, which is on high ground.)

Grein Bros. are also electrical and plumbing contractors, and are having a busy season in both lines.

Their experience with the 5-year service plan has been most satisfactory, according to Harry Grein; and they are making good money on refrigeration.

So far this territory has produced little evidence of interest in air conditioning.

Manchester League Conducts Annual Cooking Schools

MANCHESTER, N. H.—The Manchester Electrical Appliance League held its annual cooking school here recently at the State theater.

Miss Ila Manchester, Chicago home economist, conducted the cooking sessions with the assistance of Miss Delphine Lerschen, home service director of the Public Service Co. of New Hampshire.

Two grand prizes—a Kelvinator refrigerator and a Hotpoint electric range—were given during the school.

Utility Customers Without Refrigerators Are Listed

OKLAHOMA CITY—A list of all Oklahoma Gas & Electric Co. customers not using electric refrigeration has been compiled by the utility's meter readers, and is now effectively being used by refrigerator distributors as a direct-mail list and by dealers as a prospect list, according to A. A. Brown, sales manager.

THEY'LL *do* MORE THIS WAY



Texaco Capella Oils come in 6 different viscosities—from 80 to 500 seconds SUV at 100 F. They meet every need of both commercial and household units

YOU will get a more trouble-free performance from your refrigerating equipment, when you lubricate it with Texaco Capella Oils.

These oils possess unusually high stability . . . stand up longer without depositing tar, gum, or sludge. They do not react with refrigerants. Capella Oils are wholly distilled, filtered, completely dehydrated. Their low pour point assures free flow even at sub-zero temperatures. Many oils break down, stick

valves and rings . . . congeal in coils . . . reduce heat transfer . . . react with refrigerants. Switch to Texaco Capella Oils, and reduce unnecessary shut-downs, lengthen equipment life.

Trained lubrication engineers are available for consultation on the selection and application of Texaco Refrigeration Lubricants. Prompt deliveries assured through 2020 warehouse plants throughout the United States. The Texas Company, 135 E. 42nd St., N. Y. C.

TEXACO Refrigeration Lubricants



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Detroit

AIR CONDITIONING NEWS

Natkin Co. Leases New Quarters in St. Louis

ST. LOUIS—Natkin & Co., distributor of Westinghouse air-conditioning units throughout the Southwest, has obtained a long-term lease on the new quarters which it intends to occupy as soon as building construction is completed, according to S. J. Shure, vice president.

The entire building, which will house executive offices, engineering department, and storeroom, will be steam heated and air conditioned. A loading dock will be located adjacent to the building.

Jackson, Miss. Records 16 Installations

JACKSON, Miss.—Sixteen major air-conditioning installations have been made here during the past year, and local dealers have a dozen jobs more ready for closing, a survey reveals.

Restaurants have led in installations made up to now, but most business classes have been represented, including grocery stores and undertaking establishments.

Dealers cooperating in an advertising campaign this month are Koeneman Electric Co., Harwell Appliance Co., Punchard & Co., Crawford, Inc., and The Home Appliance Co.

Hommel Air Conditions Own Office and Home

PITTSBURGH—Ludwig Hommel, Norge distributor, has installed air-conditioning equipment in his own home and office, as well as in Hites drug store.

The installation in the Hommel residence provides only for summer conditioning in the sitting room and two bedrooms. All units and ducts are concealed.

Norge equipment also will provide complete year-around conditioning for the main offices and three executive offices of Ludwig Hommel & Co. Power will be supplied by a 10-hp. Norge condensing unit.

Hites main drug store, restaurant, and four second-floor truss fitting rooms will be cooled in summer by equipment similar to that installed in the Hommel offices. In winter, the equipment in the Hites installation will only clean, humidify, and circulate the air.

San Bernardino's Anderson Bldg. to Be Conditioned

SAN BERNARDINO, Calif.—Contract to install an air-conditioning system in the Anderson building has been awarded to Berner & Sswerking for \$21,000.

The contract calls for installation of insulated ducts and construction of a steel penthouse to house the system's equipment.

Lackawanna to Condition 20 More Coaches

BUFFALO—Twenty air-conditioned coaches, similar to the 30 which have been commissioned for use in recent months, will soon be placed in service by the Lackawanna railroad, according to Louis F. Heineck, general agent in the local passenger department.

Midwest Airtemp Conditions Wichita Beauty Shop

WICHITA, Kan.—Midwest Airtemp Corp., of which Harry Haid is sales manager, has installed a unit conditioner in the Ethel Franklin beauty shop here.

TEMPRITE
INSTANTANEOUS
BEER and WATER COOLERS
Detroit Michigan

G-E Introduces New Air Circulator

BLOOMFIELD, N. J.—General Electric Co.'s air-conditioning department has introduced a new air-circulator unit consisting of a three-blade, axial-flow fan, 19.5 inches in diameter, directly connected to a 1/2-hp. motor.

Standard mounting for the equipment is a steel tripod base, three inches high, which can be screwed to any horizontal surface. Pedestal mountings are offered as accessory equipment.

Designed primarily for use in ordinary homes, the new unit not only circulates air but also cools it, being capable of lowering temperatures as much as 10° F., say G-E engineers.

\$175,000 Contracts Received by Vilter

MILWAUKEE—Four air-conditioning contracts with a total value of \$175,000 were received recently by Vilter Mfg. Co., according to Frank Kirk, sales manager.

Largest of the four installations will be a 400-ton job for the Sears, Roebuck & Co. store in Memphis, Tenn. This system will be required to cool water at the rate of 1,000 g.p.m. and circulate it through coils located throughout the store.

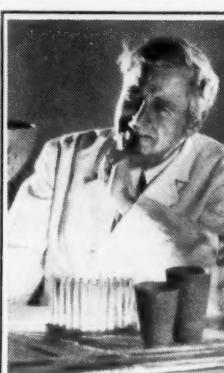
Two Vilter Freon compressors will be used in the 47-ton installation in the Sears store in Tulsa, Okla. About a month ago Vilter received a \$120,000 contract for conditioning the Kansas City outlet of this mail order chain.

A 65-ton unit will be installed to condition the 16 floors of Milwaukee's First Wisconsin National bank, and a 24-ton unit will be added to the Vilter equipment installed several years ago in the Plankington hotel here.

'Cool but Just as Cordial' Proclaims New System

PORLTAND, Me.—"Cool, but just as cordial," is the advertising slogan used by Hogan Bros., which claims to be the first air-cooled men's clothing store in this state. Cooling system was installed by Boyd Corp., Delco-Frigidaire dealer here.

The system provides a complete change of air throughout the store every 20 minutes.



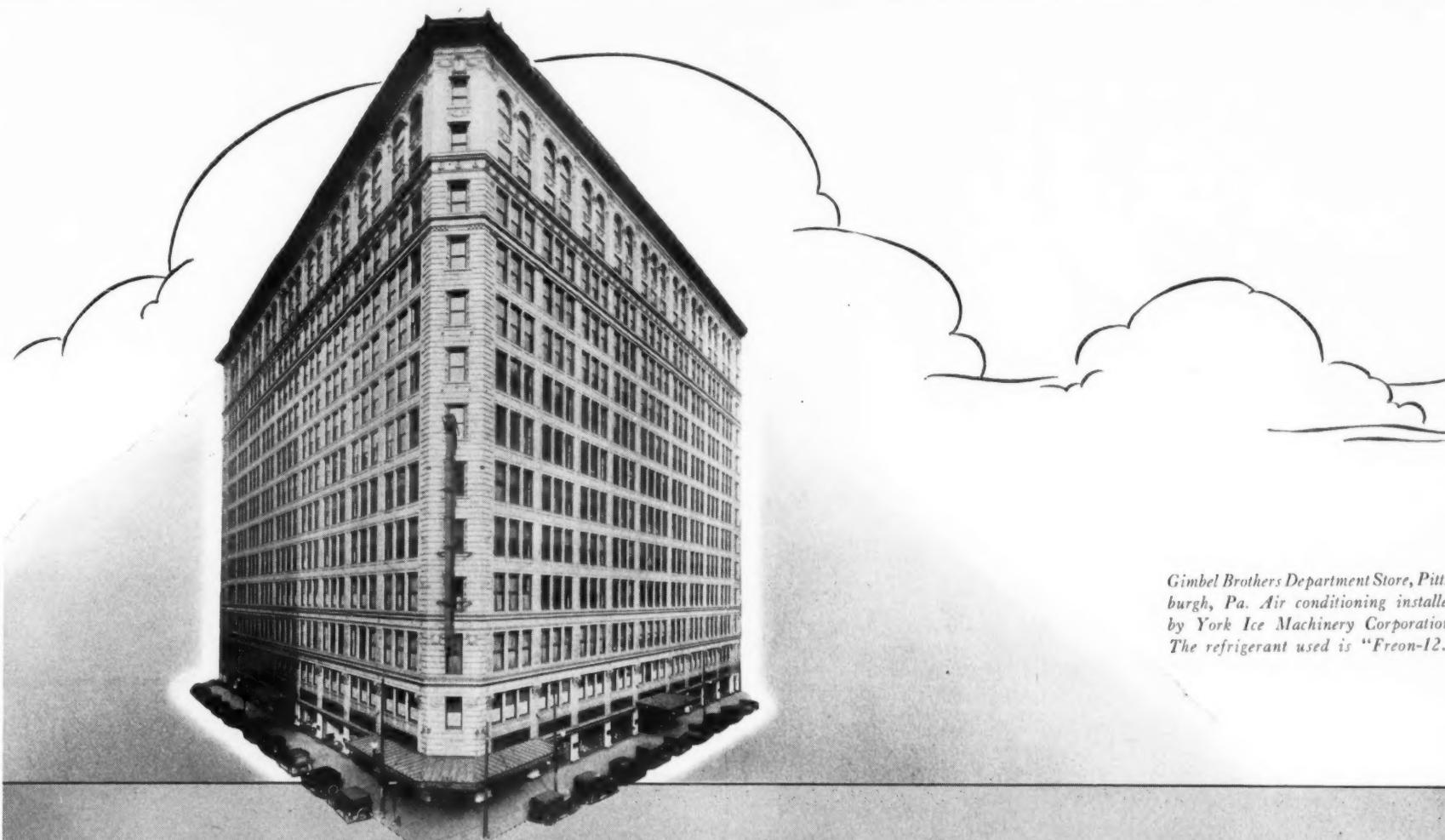
"Don't get the idea, young man, that you are the one who sold me a Copeland. I asked five or six other druggists who have Copelands, and THEY are the ones who convinced me."

Yes, you'll find Copeland Commercial Refrigeration Units the easiest to sell because of their successful record in thousands of soda fountains, restaurants, hotels, meat shops and dairies.

Write for our Sales Plan

COPELAND

REFRIGERATION CORPORATION . . . DETROIT, MICHIGAN



Gimbel Brothers Department Store, Pittsburgh, Pa. Air conditioning installed by York Ice Machinery Corporation. The refrigerant used is "Freon-12."

The Country's Leading
AIR CONDITIONED RETAIL STORES
use **FREON** refrigerants

REG. U. S. PAT. OFF.

SAFETY of life, health and property is the first consideration in any structure where men and women live, work or shop. Skillful and careful engineering in equipment manufacture and installation has done much to establish the safety records of air conditioning. Use of "Freon" fluorine refrigerants provides additional security against the danger of unexpected mishaps.

"Freon" refrigerants are non-toxic, non-flammable, non-explosive. They are odorless when mixed with air up to 20% by volume. They do not harm foods, fabrics or furs.

"Freon" refrigerants meet all the specifications for safety set by the Underwriters' Laboratories of Chicago. They have been tested by the U. S. Bureau of Mines. 99 1/2% of all mechanically cooled railroad trains use "Freon" refrigerants. They are used in ships, in mines deep underground, in hotels, restaurants, department stores, homes, schools, hospitals, offices, factories—in every type of installation, large or small.

For fullest safety of life, health and property, specify "Freon" refrigerants for your cooling system.



mark for its fluorine refrigerants.

FREON
REG. U. S. PAT. OFF.

safe refrigerants

KINETIC CHEMICALS, INC., TENTH & MARKET STREETS, WILMINGTON, DELAWARE

Holmes & Bros. Condition Superior, Wis., Theater

SUPERIOR, Wis.—A. E. Holmes & Bros. Co. is installing air conditioning in the People's theater here. George Jarvis is supervising the installation.

'Spot Lunch' Conditioned

WICHITA, Kan.—Downtown Electric Shop has installed Norge air conditioning in the Spot Lunch here.

Around the World

With George F. Taubeneck

Water Supply

London's multitudes require a daily water supply of about 261,000,000,000 gallons, and of this amount more than 150,000,000,000 gallons are taken from the Thames around Staines. The huge reservoirs there can hold a ten weeks' supply.

Much of this water is used by the London Fire Brigade to put out the numerous fires that break out in the older sections of the city. The Fire Brigade is controlled by that seemingly supreme creation, the London County Council, and has on its roster about 2,000 officers and men, stationed in all sections of the metropolitan area.

Public taxes produce the greater part of the \$4,000,000 or more needed to operate the department for a year.

It is on record that over \$10,000,000 a year is represented by the gross amount of fire insurances in force on London property.

* * *

Pickpockets, Parliament

"Beware of Pickpockets" is a notice posted in all kinds of places all over the city. Disciples of Fagin are numerous and skillful, their mastery of the light-fingered art being even more polished today than that of Dickens' villain. Their favorite hunting grounds are among crowds jostling to board buses and trams.

Of the 615 members of Parliament more than 100 represent the area of Greater London; and 62 of this delegation are elected from the County of London, one from each parliamentary constituency and two from the City of London.

This large representation makes London a dominant voice in the political affairs of the kingdom; yes, and of the Empire, too.

* * *

Museums

Let's have a look at a few of the more interesting things housed in London's museums, art galleries, and other such exhibitions. This is the city of museums, which are wells of knowledge for all.

Probably London's oddest *objet d'art*, and this term is applied with considerable doubt, is one displayed in College of Surgeons' Hunterian Museum. It consists of Napoleon's intestines. Its purpose is to reveal the progress of the disease that caused the death of the fallen emperor at St. Helena.

Crude flint and stone weapons and implements used by the inhabitants of England back in the Stone Age are on display in Lancaster House, home of the London Museum since 1913.

The much-discussed Rosetta Stone, on which is inscribed a passage of hieroglyphics, demotic characters, and Greek, and which led to the deciphering of the Egyptian hieroglyphic system, is exhibited in the British Museum.

This same museum receives a copy of every book printed in the United Kingdom. It's 3,250,000,000 volumes fill up 55,000 miles of shelves. The collection is increasing at a rate of about 50,000 a year.

In Whitehall Banqueting Hall, now the Royal United Service Museum, is a large scale model of the Battle of Waterloo, covering 400 square feet, and exhibiting 190,000 little figures of soldiers and horses.

A companion exhibit is the model of the Battle of Trafalgar, mounted on a table made of oak taken from Nelson's flagship *Victory*.

Downstairs in the Crypt is a large panorama of the Spanish Armada being routed by Drake and his English sea-dogs.

Contents of the world-famous wax-works museum, Madame Tussaud's, are so familiar that they need no further comment here.

These are merely scattered features of a paltry few museums. But your correspondent had little time to spare for such exhibitions.

Athletic, Chelsea, Clapton Orient, Crystal Palace, Brentford, and Queen's Park Rangers.

Towards the close of each season, usually sometime in April, the cup final match is played in Wembley Stadium before some 100,000 spectators drawn from all over the whole United Kingdom. Several American newspapers regularly carry English Association football results.

Cricket centers in two grounds—Lord's north of the Thames and the Oval to the south. The former is the home field of the Middlesex Cricket Club; and in addition to the regular county league games played between this team and visiting county elevens, at Lord's the annual Eton vs. Harrow and Oxford vs. Cambridge games are played.

Kennington Oval, usually just called "Oval," is the home of the Surrey C. C., another of the famous teams in the county league.

In the days of Jack Hobbs, the Babe Ruth of cricket, it was invariably at or near the top in the final standings.

These two grounds, Lord's and the Oval, are but the centers of major league cricket. There scores of other playing fields around the city where teams from the minor leagues down

ment business of the city, and almost every theater from the large downtown "palaces" to the little neighborhood shows is well-filled afternoon and night.

American pictures are greatly appreciated, except when they seem to tread on England's sensitive toes a little (as was the case with *Mutiny on the Bounty*), and our "horse operas" are avidly absorbed by the Cockneys.

A variety of stage entertainment is to be found in London, everything from grand opera to cheap "burlesque" (the quotes because in England the word burlesque has retained its proper meaning, which is, as given by Webster, "literary or dramatic travesty by ludicrously extravagant incongruity between a subject and its treatment.") Strip-teasing is out, definitely.

Covent Garden is the London home of opera. It is built according to the Italian idea of an operatic theater, with many curved tiers of private boxes. An opera house for the general public was opened with great hopes just before the War, but failed financially, and has since been converted into a cinema.

The general public does appreciate opera, though. This is shown by the fact that the Old Vic theater, now presenting both opera and lighter entertainment alternately, is making a go of it.

Drury Lane, London's theater of theaters in history and reputation, is today the stage where the most successful dramatic presentations are given, with the traditional pantomime the attraction at Christmas time.

London's present crop of actors and actresses includes such internationally popular players as Charles Laughton, who divides his time between the stage and the screen, John Gielgud, recently on Broadway as Hamlet, Mrs. Patrick Campbell, who has been seen on the screen, Sybil Thorndike, as yet not tempted away from London, Gladys Cooper, one of the most talented of the English actresses (she recently appeared on the American stage), Gertrude Lawrence, who cavorted with Noel Coward last season in New York City, Evelyn Laye, musical comedy and operetta star, and four immensely popular popular musical comedy stars, Jack Buchanan, Gracie Fields, Jessie Matthews, and Jack Hulbert.

Foremost theater for variety shows is the Palladium, where Gracie Fields, Sophie Tucker, the Russian Ballet, Jack Hylton's Band, the Mills Brothers, Borrah Minnevitch's Harmonica Rascals, and other local and visiting entertainers are stand-bys.

Whence cometh the "moaney"? Aha! Just ask Johnny Q. Bull. All owners of receiving sets pay license fees that rest most heavily on their budgets, and from the accumulated fortune of such fees the B.B.C. draws a goodly share. This, plus the income from its journals, makes for its prosperity.

Broadcasting House is an acoustical marvel. It is sealed like the Tomb of King Tut, and its ventilation system is not unlike that of submarine studios are underground to insure almost perfectly sound-proof conditions.

Throughout the studios, offices, control rooms, and other nooks and crannies of the huge edifice there work some 3,000 employees.

The B.B.C. occasionally has trouble with the "plug bootleggers" who send radio advertising messages (in English, promoting British products) into England from Continental broadcasting stations. This is one thing the (Continued on Page 8, Column 1)

practically monopolized by certain sets—the inescapable English system of class distinction. He by no means can saunter alone into a club. They are strictly "membership" affairs, like our Prohibition speakeasies.

Even if he goes for a midnight stroll along the Embankment he is eyed warily by the bobbies on duty.

Like popcorn in a roaster there have popped up all over the downtown area of London little sandwich and snack bars, which are patronized by the rushed hired help of offices, and by the lesser members of theatrical troupes, who seem doomed to a life of taking lunch "on the hoof."

The neighborhood of Piccadilly Circus and Leicester Square has a severe rash of these lunch wagons, the "grababitenswig" places. The usual order is, "Sandwidge 'n' cuppa tea!"

* * *

BBC

The British Broadcasting Corporation, which has a virtual monopoly on "wireless" in the United Kingdom, was founded in 1922 as an amalgamation of the radio companies of Marconi, Radio Communication Co., Metropolitan Vickers, British Thomson-Houston Co., General Electric, and Westinghouse.

A royal charter was granted to the organization in 1926 for a period of 10 years, and by its terms the B.B.C. became a public institution of a nature somewhere between a governmental department and a commercial undertaking. The company is considered independent in its operations, although under the "protective control" of the government. Actually, it is a powerful body, with considerable political influence.

This royal charter was renewed last year with scarcely any changes, and so the B.B.C. is now in its second decade.

Although it receives no fat checks from advertisers (commercial announcements being barred by law), the B.B.C. has built itself a magnificent, huge new home in Portland Place.

It has become also the publisher of three profitable weekly journals, the *Radio Times*, with a circulation of three million, the *Listener*, more literary than either of its two companions, and the *World-Radio*, a technical paper for the mechanically minded.

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Announcement

This instalment is the end of the editor's "World Series," a lengthy continuity of articles based on his study of markets for air-conditioning and refrigeration products, world trade, and national characteristics in 33 different countries.

But it is not the end of editorial attention in the News to the development of the export field, which offers such great possibilities to the industry. Foreign news contacts will be maintained; readers' knowledge of world markets will be kept up-to-date.

And a new series of special studies of foreign markets is scheduled to begin in the next issue. First article will be a colorful story on the fascinating isle of Tahiti—where a Crosley dealer maintains a refrigeration monopoly—by George Christensen of the Chrysler Corp., who has just returned from a three-months' trip to this South Seas paradise. Mr. Christensen shares a hotel apartment with Editor Taubeneck.

Following this article will come a series of presentations of the markets in Japan, China, the Philippines, and points East by John Strohm, boyhood friend and fraternity brother of the editor. Mr. Strohm is now engaged on an unorthodox tour of the world, and writes in a highly readable, pungent style.

In response to numerous requests from subscribers, the editor's "Around the World" series, augmented with later information and many more pictures, will be published in book form.

Sports

Sports play a great part in the everyday life of London. Association football (soccer) holds sway in the fall and winter, while cricket is king in the spring and summer. Racing, both horse and whippet (or greyhound), is a close rival to the major sports.

Not far behind comes rugby, the English near-equivalent to American football. Oar-pulling reaches its peak during the day of the Oxford-Cambridge race, the Saturday before Holy Week, although an almost equal amount of enthusiasm is bubbling at the Henley Regatta in early July.

Soccer is represented in London by no less than ten league teams, the Arsenal, West Ham United, Tottenham Hotspurs, Fulham, Millwall

to the amateur "sandlotters" play.

There is not much golf played right in London, because land is at a premium and is not readily granted for the laying out of extensive courses. However, there are many private and public links available outside the metropolis.

Eight out of ten from London's working class can be expected to lay anywhere from a tanner to five bob regularly on some horse or dog they fancy to win. Bookies flourish.

And who has never heard of the English Derby, run each year since 1780 at Epsom Downs (what a name!) just south of the city? The Derby is the people's race; the Ascot is society's race. The latter is probably the premier style show of the world.

The recognized tennis championship of the world is contested each year at Wimbledon, on the southwestern outskirts of town. Surrounding layout is pretty, but I thought the stands were rather rickety.

As the Indianapolis Speedway is to American automobile racing so is Brooklands Track to English speedsters.

Outdoor skating on naturally frozen ice is only occasionally possible in London, for the combination of salt air and mild winters doesn't freeze many ponds. Rinks with artificial ice are open, however, at Golders Green, Hammersmith, Streatham, at the Ice Club, and at other places in the city. Over there ice skating, ice carnivals, ice pageants, and skating shows are far more popular than in America.

Cinema & Stage

Theater and motion picture entertainment is profuse and lavish in London. The cinema has become the leading moneymaker in the amuse-



No beaters-about-the-bush or hemmers-and-hawers, the cockneys. As the picture would indicate, they are frank, forthright, direct sort of people.

England Prizes Antiques



From the uniforms and immobility of its palace guards to the pewter in tea rooms, England's antique trappings are treasured like jewels by the citizens. Americans like them, too; and pay round prices for them.

COMMERCIAL NEWS

Features of New G-E Line Listed

(Concluded from Page 1, Column 2) the cabinet on the three smallest models.

Features include a three-coat porcelain enamel finish inside and out, adjustable shelves, automatic interior light, textolite door strips, heavy gauge steel construction, extra-heavy insulation, and modern chrome plated hardware.

Model HC-21-M, smallest unit in the line, has a shelf area of 35.5 sq. ft. and a net storage capacity of 20.2 cu. ft. It has six ice trays with a capacity of 19½ lbs. per freezing.

Model HC-31-M has a shelf area of 42.5 sq. ft. and a net food storage capacity of 29.2 cu. ft. Ice cube capacity of the unit is similar to that of the smaller model.

Model HC-31-S has a shelf area of 50 sq. ft. and a net storage capacity of 31.5 cu. ft., and is designed for use where ice-making is not a requirement in connection with the use of a storage refrigerator.

These three models are self-contained units, the G-E condensing unit being located in the base of the cabinet.

Two largest models, HC-41-C and HC-64-C, are not equipped with ice-makers, and are designed for remote installation of the refrigerating machine. First of these, the HC-41-C, has a shelf area of 55.9 sq. ft. and a net storage capacity of 40.95 cu. ft. Largest model has a shelf area of 87.96 sq. ft. and a storage capacity of 64.85 cu. ft.

All models in the G-E commercial refrigerator line use two-cylinder compressors, with capacitor type motors, equipped with "thermometers" for automatic overload reset protection. Freon-12 is the refrigerant in all models.

Georgia Power Reports Commercial Sales Good

ATLANTA — Commercial refrigeration and water cooler sales of \$66,326.66 helped materially to swell the combined commercial sales of Georgia Power Co. to a total of \$119,613.93 for the first four months of 1937.

Air-conditioning sales for the same period totaled \$4,984.30, ventilating fan sales did no better than \$600.51, water heater sales totaled \$5,132.22, and sales of cooking and heating equipment reached \$11,425.68.

The Atlanta, August, and Rome divisions were the only ones to record sales of air-conditioning equipment or ventilating fans, but other commercial equipment sold well in all sections.

Macon division led the field in commercial refrigeration sales with a total of \$14,982.97, while the Atlanta, Augusta, and Columbus division were in close race for second.

Ice Crop Failure Booms Conn. Farm Market

HARTFORD, Conn.—Electric refrigeration equipment is being installed on a wide scale by Connecticut dairy farmers because of the lack of natural ice this season, according to Ken E. Guyer, manager of the Connecticut Milk Producers' Association. Practically no natural ice was harvested in the state throughout the mild winter.

BRUNNER

Send for the New
REFRIGERATION CATALOG

Eight Models of Compressors
Forty-one Models of Highsides
from 1/6 H. P. to 15 H. P.
BRUNNER MANUFACTURING CO.
UTICA, N. Y.

Houston Reports 106 Coolers Sold in May

HOUSTON—Sales of 106 beverage coolers, eight display refrigerators, six storage refrigerators, two water cooling systems, 27 water cooling units, and 35 miscellaneous refrigeration applications were made in Houston during May, according to reports made to Houston Light & Power Co. by distributors and dealers.

A leader in beverage cooler sales is the Houston office of Brunswick-Balke-Collender Co., with sales of 20 new "Blue Flash" units during the past 40 days. Ed Morton, sales manager of the branch, has set the June beverage cooler quota at 150 units.

New Beer Cooler Saves Owner \$35 a Month

PERTH AMBOY, N. J.—A Carrier automatic beer cooler consisting of a diffuser in a pre-cooling unit, a combination ice maker and cooling coil, a four-tap control cooling unit, and a cooling coil for the back bar has been installed in a tavern owned by Harry O'Donnell.

Mr. O'Donnell reports a saving of \$35 a month in comparison with his old cooling system.

Reinach Estimates 25,000 Water Cooler Sales in 1937

DETROIT—More than 25,000 electric water coolers, valued at approximately \$2,500,000, will be installed in American offices, factories, stores, and theaters this summer, estimates A. H. Reinach, sales manager of the liquid cooling and standard commercial departments of Kelvinator division of Nash-Kelvinator Corp.

This will mean a jump of 40% from last year's record of 19,000 water coolers, with installed value of \$1,890,000, he points out.

—and now the new IMPERIAL "SYLPAK"!

IN THE greatly expanded 1937 line of Imperial products for refrigeration and air conditioning work is a complete new group of Sylpak Shut-off Valves. These valves have a shorter bonnet and fit in a 4-inch conduit box.

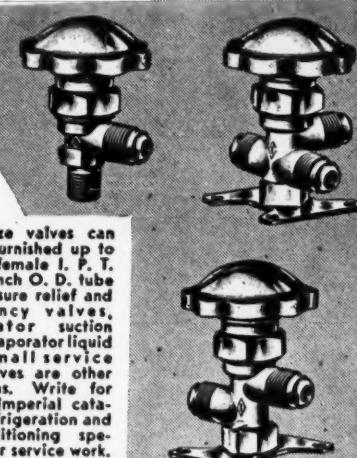
Built for tube diameters ranging from 1/4 to 3/8-inch for S. A. E. or solder fittings as desired. Brass forged body is non-porous, strong, and uniform, and has full size openings. Leak-proof metal seat.

Try these new Imperial Sylpak valves on your next job.

IMPERIAL BRASS MFG. CO.
565 S. Racine Ave., Chicago, Ill.

IMPERIAL Valves
FITTINGS • TOOLS • CHARGING LINES • FLOATS • DEHYDRATORS • STRAINERS

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FROM YOUR
JOBBER



Large size valves can also be furnished up to 1½-inch female I. P. T. and 1¾-inch O. D. tube size. Pressure relief and emergency valves, evaporator suction valves, evaporator liquid valves, small service drum valves are other new items. Write for the new Imperial catalog on refrigeration and air conditioning specialties for service work.

A Quarter Million Dollars to Provide Additional Facilities for Training Men

New Buildings . . . New Equipment . . . Improved and Enlarged Training . . . Added Personnel . . . Now Being Provided to Keep Refrigeration and Air Conditioning Institute Training Abreast of the Industry's Needs.

THE Refrigeration and Air Conditioning Institute believes not only in the future of the great industry it serves, but believes also that it is making itself indispensable to this industry by performing an unusual and outstanding job of personnel training. And it is backing this belief with an expenditure which probably represents the largest investment ever made in equipment and other facilities to be used in training men for a single industry.

Now nearing completion, is an entirely new Training covering every phase of air conditioning (including refrigeration), and requiring on the part of the student, more than 1,000 hours of study and preparation in his own home . . . twenty-five percent more time than has been previously required.

A new laboratory and shops building, costing \$100,000.00, to be completed in 1937, will house equipment for giving FINAL training to five times more men than present facilities provide, and enables us to increase the training period from two weeks to four weeks. This building will provide more than 15,000 additional square feet of floor space, and will be built of glass block, and completely air conditioned.

Estimated cost of additional equipment required to equip laboratory and shops is \$150,000.00. All of this equipment will be in full operation, and will be for the sole use of students who are brought to Chicago for this FINAL four weeks of training, with prepaid, round-trip bus transportation furnished them.

The new laboratory and shops will include a new heating laboratory and greatly enlarged air conditioning and household and commercial refrigeration shops. In these, students will perform standard service and repair operations; tear down and reassemble apparatus; estimate and plan systems; make installations and operate and check them.

The air conditioning section will include all types of systems in complete installations, and will thoroughly cover cooling, distribu-

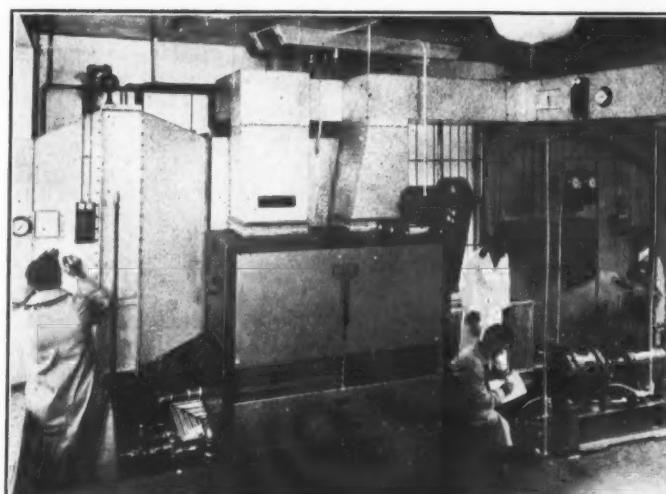
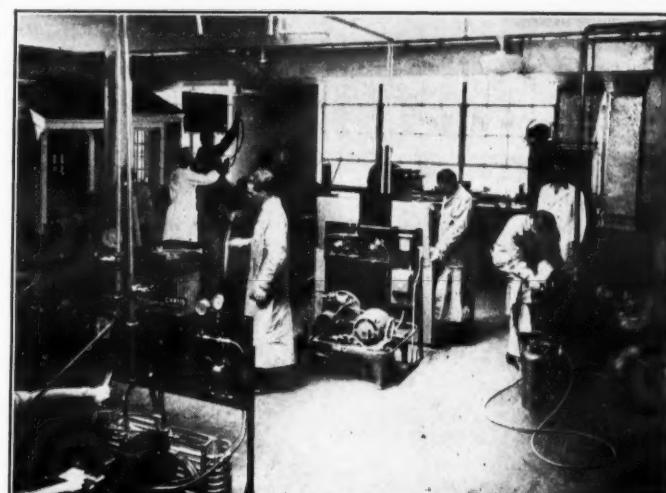
tion, circulation, humidifying, de-humidifying, and air infiltration, with instruction on evaporative condensers and cooling towers. In the heating laboratory will be installed, the various types of oil burners, stokers, gas and hand fired furnaces, steam, hot water, vapor, warm air, and split systems. A feature of every department will be the installation, operation, and maintenance of all types of control systems.

Thus, with an additional expenditure of more than \$250,000.00 for buildings, equipment, and training material, we prove our belief in the future growth of the business of refrigeration and air conditioning, and our sincerity of purpose in attempting to do the finest job of training men that has ever been done in this or any other industry. We are expanding to be better able to meet your needs . . . to keep abreast of the advancement of your industry . . . to assure an adequate supply of men trained exactly as you want them trained.

Because of the high quality of its training, and the broad knowledge and efficiency of the men it turns out, the Institute enjoys the official endorsement of more than fifty of the leading manufacturers in the field. Such recognition is most unusual. So is the plan under which the Institute operates, being as it is, supervised by a Board of Governors, made up of factory engineers and executives appointed by some of these manufacturers. Great credit must be given to this board for producing and maintaining such an outstanding training. So far as we know, this is the only instance on record in which an industrial training institution is supervised by members of the industry it serves.

Applicants for training are selected on the basis of education, experience, background, mechanical aptitude, and character. Only men whom it is believed will make good with an employer are admitted for training.

We invite members of the industry to visit the Institute when in Chicago, and to write us for help with their personnel problems.



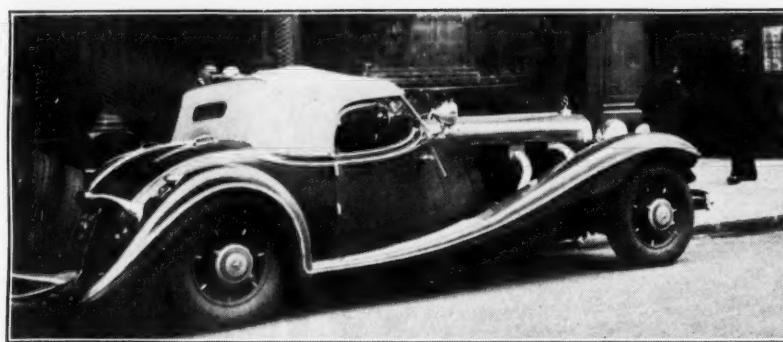
Two views of the Institute's Laboratory and Shops which are to be enlarged to five times their present capacity. Above: Partial view of Commercial Refrigeration Section with air conditioned house, within an air conditioned building, in background. (Less than one-half of equipment in this department shown in photo.) Below: One of two year 'round air conditioning systems in complete operation.

Ray E. Smith
PRESIDENT

"Officially" Endorsed by More than 50 Leading Manufacturers

Refrigeration and Air Conditioning Institute ★ 2130 - 2158 Lawrence Ave., Chicago

Cars Are Fast, Small, Low



English cars are taxed by horsepower; hence they are made low and small. Some of them, however, are very fast—notably the Lagonda, Bentley, M-G, and Standard Swallow. The Morris and Austin are biggest sellers.

(Continued from Page 6, Column 5)
B.B.C. doesn't seem able to cope with short of bringing on an international "incident"—something which the Foreign Office doesn't care to risk.

Quaint Names

One noticeable thing about London is the quaintness of many of its names. I compiled a fairly lengthy list of those which amused me. If there aren't any strong objections I'll run through them quickly without any further comment, just letting you form your own reactions to them:

Addle Hill, Amen Corner, Bacchus Walk, Barking Court, Birdcage Walk, Bird in Bush Road, Cheapside, Church of All Hallows-on-the-wall, Church of St. Andrew-by-the-Wardrobe, Church of St. Botolph Without, Coldbath Square, Cowcross Street, Cripplegate Street, Crutchedfriars, Ebbesfleet Road, Elephant and Castle, Finch Street, Flask Walk, Folly Wall, Gopsall Street, Green Man Street, Horsleydown Stairs (the clumsy thing!), Houndsditch, Isle of Dogs, Knatchbull Road, Little Bath Street, Little Love Lane, Micklemhwaite Road, Ogle Street, Old Pye Street, Old Paradise Street, Paternoster Row, Peckham Rye, Ropemaker's Fields, Rotten Row, Savernake Road, Seething Lane, Shoot-up Hill, Skidmore Street, Slaidburn Street, Slipper's Place, Spitalfields, Stoge Poges, Tattersall's, Threadneedle Street, Totty Street, Treadgold Street, Walbutton Road, Wapping Old Stairs, Wrigglesworth Street, and Mincing Lane.

Gas Masks and Bombs

Almost every man who passes by the Cenotaph in Whitehall, I noticed, reverently raises his hat. London has forgotten very little of the last terrible war.

The German air raids inoculated the virus of terror into the hearts of Londoners, and the memory of those attacks from the sky, coupled with the knowledge of what science has wrought to make aerial warfare infinitely more horrible in the future, makes every thinking citizen of London fear the idea of a repetition of the 1914-1918 war.

Not only are Englishmen thinking about what might easily happen to them; they are preparing for it. Munitions factories are running at high production rates day and night, turning out all kinds of armaments and ammunition.

Over 40,000,000 gas masks are being made for the citizens of the more closely populated areas—men, women, and children. Air training schools are graduating more and more young men as pilots. The British Navy is feverishly being enlarged and made more efficient.

Arrangements for drafting men quickly to the army have been made. Bomb-proof cellars are being constructed in public buildings and in private dwellings. Mass training in fighting gas attacks is maintained. Even London's streets are being widened and improved to make transportation faster in the eventuality of war.

This, then, is the London of today. On the surface, the city goes about its daily business in the usual bustling, clumsy manner. Under the surface, the city is tense and uneasy, but nonetheless ready for whatever may happen.

Do not envy the London of this generation.

Britain is Great

Excluding Ireland (which, according to Eamon DeValera and his adherents, is now constitutionally the Republic of Eire) Great Britain is

composed of England, Scotland, and Wales.

Total area of this, the largest island in Europe, is 88,745 sq. mi. Respective areas of England, Scotland, and Wales are 50,874 sq. mi.; 30,405 sq. mi., and 7,466 sq. mi.

As you can see, it isn't a very big country, even if the population per square mile is exceedingly dense. But this little island comes close to being the Center of the World; and its inhabitants are overlords who run the greatest empire in history.

Why? Because they are great individualists. They have been great fighters; they know more about trading than any race that ever lived, with the possible exception of the Dutch and the Phoenicians. And they are probably the finest administrators of alien territory since the Romans.

Their race is known as the Anglo-Saxon, although it really is the Norman-Saxon. Nobody has ever really placed the mythical Angles. Originally the Celts lived there; then came the Romans. The Saxons pushed out the Romans, and then gave way to the Normans.

This latter fusion, aided by the protection of the British channel, has held sway ever since.

How did they happen to initiate their conquest of the world? Well, the most colorful of their kings, Henry VIII, wanted a divorce so that he could marry Anne Boleyn. The Pope said: "No, you can't have a divorce."

So the independent Henry and his equally independent subjects said: "You can't do that to us." And they severed connection with the Vatican.

That meant they had to fight Spain, the great maritime power of the time, because Spain resented this insult to the Pope. So they had to build ships, and learn to fight in them.

This they did so well that they toppled Spain from her high perch; and, having ships and sailors and fighters all dressed up with no place to go, they went on to sail around the world and established the British Empire.

This turned out to be profitable. They accumulated enormous capital. One of their citizens, James Watt, invented the steam engine, which led to the industrial revolution, the industrialization of England, and the accumulation of much more capital. Thus they were able to buy control of the world, in addition to their conquests and rule by force.

With so much wealth at hand, plus

its unrivaled knowledge of how to trade and how to administer, England has been able to be boss ever since.

Whether or not England will remain boss through the next few decades is a matter open to considerable conjecture. Unrest and powerful enemies threaten the empire on any number of points: India, Malaya, Egypt, Palestine, and especially at home.

But this one thing is irrefragably in its favor: the character of British statesmen. Elucidation of this statement would require a book in itself; suffice it to say that through generations of power and acquisition of administrating knowledge, plus the indefatigable persistence and pre-eminence of the code of gentlemen's traditions, British statesmen are peers of the world.

Britain is Great.

Fog, Rain, Drizzle

It is a common belief that it is usually raining in England. This is slightly erroneous. Most of the time it merely drizzles.

A good, robust rain is really preferable to the miserable showing of precipitation too often made by the elements in Great Britain. However, in a year the droplets accumulate to a total of about 34 inches.

Fog, first cousin to the drizzle, is a frequent visitor to many parts of the country, particularly the coastal regions and the low-lying fen districts.

London seems to have been built in the foggiest region of the whole kingdom, for it is often enveloped in a blanket of moisture ranging in texture from a light mist to a real "pea-souper." The latter has come to be known as a "London fog."

In general, the climate of Great Britain is mild and comparatively warm, and is pretty evenly broken up into spells of good and bad weather. The Gulf Stream, which considerably swerves up alongside the islands, brings with it a hangover of tropical Caribbean balminess.

Britain's mean annual temperature is 49°. Winters are not severe, summers are not unbearable, autumns are foggy and wet, and springs—. Springs? You've read Browning's *Home Thoughts from Abroad*? Well, the Pope said: "No, you can't have a divorce."

So the independent Henry and his equally independent subjects said: "You can't do that to us." And they severed connection with the Vatican.

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In actual practice, the executive power is wielded by the prime minister and his cabinet. So long as the prime minister has the backing of a majority of the members of the House of Commons, his is the guid-

British Sons Go to Sea



Careers in the army and navy, like careers in politics, are fashionable for well-born and well-educated young Englishmen. Above are two young English officers "shooting the sun."

ing hand of the kingdom and, to a great extent, of the whole British Empire.

The prime minister acts on the advice of his cabinet, but he usually selects his own ministers to form that body. They all work in close cooperation, and whatever decisions are reached, those decisions are the congealed thoughts of the entire group.

Parliament, as is well known, is comprised of the House of Lords, sometimes referred to as the House of Peers, and the House of Commons. The latter is the really important legislative body.

The Houses of Parliament have functioned in their present form since way back in the middle of the 14th century, when Edward III was king.

At that time, and for long afterward, however, the peers were the dominant body. It took several reform bills and changes in public attitude to manoeuvre the House of Commons into its present exalted position.

Lords in the upper house are both temporal and spiritual in rank. House of Lords has no set membership, although a full house would number about 725. Most numerous are those peers whose titles are hereditary. They qualify for a seat in the chamber merely by being born.

Next come those who acquire eligibility when the reigning sovereign bestows upon them titles of nobility.

The Law Lords, the two archbishops (Canterbury and York), and the 24 or so bishops are granted membership in the house by virtue of office. Some 16 Scottish peers are elected for the duration of each session of Parliament.

What the present status of any Irish members of the House of Lords might be I don't know. Irish peers used to be elected for life, and there were 28 of them. Whether or not the nobility still exists in the new republic is a question I'd like to have answered.

The Commons is strictly an elective body, the 615 members being popularly chosen representatives of county, borough, and university constituencies.

Large Cities

Largest and, economically, most important cities in England, excluding London, are Birmingham, second city in the kingdom and center of a large metal-working area; Manchester, hub of the Lancashire cotton industry; Liverpool, bustling Lancashire seaport; Sheffield, the steel city; Leeds, home of the large woolen and iron industries; Hull (technically Kingston upon Hull), Yorkshire's main port; Newcastle, coal and shipping capital of the northeast; Bristol, manufacturing city and port of the southwest; and Southampton, now the leading passenger port in the south.

Scotland's greatest city is Glasgow, shipbuilding and manufacturing metropolis. Most interesting Scotch city, though, is the capital, Edinburgh.

Cardiff and Swansea, both ports and mining towns, are Wales' largest cities.

Fast Railroads

An intricate network of steel tracks has been laid to cover the whole island, and to provide fast, cheap

railroad transportation for Britain's millions. All told, the railways cover a length of more than 25,000 miles.

Light railways (suburban and connecting) and tram lines have an aggregate length of about 2,400 miles.

Of the 4,700 miles of canals cut throughout the kingdom, the most important stretch is the Manchester Ship Canal, 35½ miles long. It is connected, directly or indirectly, with all the main railroads and barge canals in the country, and is an ever-busy waterway between Manchester and Liverpool.

Great Britain's motor traffic is composed of more than a million passenger cars, about 50,000 buses, some 350,000 trucks, and innumerable motorcycles.

Measures, Money

British standard units of weights and measures are the yard, the gallon, and the pound.

The official gallon is 10 pounds avoirdupois of distilled water, conditions being that the temperature is 62° F. and that the barometer stands at 30 inches.

The standard pound weight consists of 7,000 grains.

Unit of Britain's monetary system, of course, is the pound sterling which, at par, is equivalent to \$4.8665 in American currency. The pound is subdivided into 20 shillings, each containing 12 pence.

Religion

Except for about 300,000 Jews, a few non-Christian foreigners, and a number of self-styled atheists, the British are a Christian race. More than 2,500,000 are Roman Catholics, the rest Protestants of various denominations.

Church of England is the state religion. Its importance was demonstrated when one of its archbishops forced Edward VIII off the throne early this year.

Vast majority of the British Empire's population, however, is Moslem. There are signs that this will lead to incalculable trouble some day.

Pride and the Empire

Totaling one-fourth the world's territory, the British Empire is a loose confederation of nations bound together chiefly by pride. Canada, Australia, New Zealand, and South Africa are Dominions. Ireland is establishing itself as an independent republic.

India, one of the most important portions of the Empire, is a colony, not a Dominion—in spite of the tremendously important efforts of Mahatma Gandhi and Pandit Nehru. Bleak Newfoundland was once a Dominion, but recently abandoned its autonomy voluntarily. The Malay States, hordes of islands, and the Mandated Territories are all ruled as colonies.

The Dominions enjoy as much self-rule as almost any independent nation. They are all democratic in form, with representative governments.

When the immensely popular Edward abdicated, it was feared that the prized cohesion amongst this group might become unglued. But it was soon seen that fealty to a symbol,

(Concluded on Page 10, Column 5)



Typical of the English passion for gentility is the Boy Scout movement, which originated in London with Sir Robert Baden-Powell, and which teaches boys to be resourceful, self-reliant little gentlemen at all times.

Fast Railroads

An intricate network of steel tracks has been laid to cover the whole island, and to provide fast, cheap

Air Conditioning Reduces Costs, Builds Profits, Chicago Printers Find

CHICAGO—Reduced printing costs, improved conditions, and increased profits through installation of air-conditioning equipment in both large and small Chicago printing establishments is reported in an article entitled "Air Conditioning Has Cut Costs and Increased Profits for Chicago Printers" in the May issue of The American Printer. H. H. Slawson is the author of the article.

In every one of more than a dozen plants where air conditioning has been installed, there is the same enthusiastic agreement when the question "Have you found it profitable?" is raised, Mr. Slawson says. Every shop foreman and pressman interviewed declared air conditioning to be an aid in operations, while executives reported savings.

During the unseasonably hot and dry summer of 1934 in Chicago, etching processes in the dark room of the Henneberry Rotogravure Corp. were in chaotic condition, writes Mr. Slawson. When outdoor temperatures ranged up to 110° heat inside the dark room was terrific.

HEAT HITS COLOR RUNS

Gelatin coatings of carbon tissue paper used in the operations buckled, blistered, or slithered off the surfaces completely. What few plates for color jobs could be produced were lost when efforts to register the colors on the presses proved futile because torrid temperatures had shrunk the paper abnormally between runs.

"We tried every means possible to keep the air moist, but without result," W. H. Beckman, superintendent of the Henneberry plant, related. "There seemed to be nothing to do but give up and close the plant until cooler and more humid weather came along."

Henneberry officials chanced to observe air-conditioning equipment on display at the Century of Progress exposition then going on, and decided, as a last resort, to install a three-ton system in their dark room.

"Over night the change was remarkable," Mr. Beckman said. "Our troubles vanished. We felt as if we had been missing something all our lives heretofore."

This initial three-ton installation sold the Henneberry firm on the value of air conditioning in printing processes, and a 40-ton Westinghouse system was thereafter installed to condition practically the whole plant.

"Yes, it was a heavy investment," Mr. Beckman admitted, "and we had to make it at a time when business was dull. But it is paying its way. Under the old conditions we had to turn down many jobs because we could expect trouble in getting them out. Today we are taking that business in and more of it, especially the color work, so I can truthfully show that air conditioning has been profitable to this concern."

HEALTH IMPROVED

Concerning the health aspects of air conditioning in the print shop, Mr. Beckman added that on hot days his men prefer to spend their time in the plant during the noon hour instead of going outside to seek more comfortable conditions as heretofore.

Among the larger air-conditioning installations now operating in Chicago printeries is a 110-ton Carrier outfit conditioning the air in several departments of the large R. R. Donnelly plant, a 60-ton Frigidaire system at Alco-Gravure, Inc., Meyer-cord Co.'s 100-ton Carrier installation for the decalcomania process, and a 35-ton Offen-Frick machine in plant of the Neo-Gravure Co.

"In old buildings, however, installations are costly. If an air-conditioning system can be built into a printing plant as it rises from the foundations, the cost will be much less."

"The ideal industrial building of the future," he added, "is going to be one of those structures that has no windows. Air conditioning will, of course, be essential, but it

wrinkle, with difficulties familiar to all printers."

"The paper would not feed right on the automatics and the color work would not register. All that was overcome with properly conditioned air. Our little outfit occupies barely four square feet out in the center of the pressroom, but it has had tremendous effect in saving time at the presses in eliminating spoiled stock. It has also been possible to make savings by buying paper in large quantities, thus getting the benefit of price discounts."

A. F. Cox, superintendent of maintenance for the Manz Corp., declared that properly controlled humidity and temperature keep composition rollers from swelling or shrinking, which causes trouble with blurred plates or light impressions.

A constant diameter for the rubber rolls, he added, is essential in offset printing, and proper degrees of humidity assures this and obviates the trouble and added expense caused by slipsheeting. Mr. Cox also noted that rubber rollers do not wear out as quickly as they do when air conditioning is absent.

"Air conditioning is becoming daily more essential to the printing industry," said Mr. Cox. "In some departments, such as color printing, it is indispensable to the highest class of work."

"In old buildings, however, installations are costly. If an air-conditioning system can be built into a printing plant as it rises from the foundations, the cost will be much less."

"The ideal industrial building of the future," he added, "is going to be one of those structures that has no windows. Air conditioning will, of course, be essential, but it

will prevail not for the building's sake alone but because it will play a practical part in printing operations."

Another Chicago printer said that after his air-conditioning system had been in operation two months, he made cost comparisons.

"We had absolute production records on jobs we had handled for a number of years," he said, "and we found that our present production was increased from 8% to 10%. This, we know, is due to the proper conditioning of the paper."

"Recently, also, we completed several folding jobs, including some 'over-over' folds where the strain is terrific on the last fold. Heretofore we had never been able to produce finished pieces without cracking the edges of the last fold. This problem has been entirely eliminated and folding production has been increased 10% by actual records."

In the same plant, it was found by comparison of records on duplicate jobs that ink consumption was reduced 5%. The ink was said to have a much better flowing capacity, giving absolute, even distribution and resulting in perfect printing.

AFFECTS INK

One manufacturer of air-conditioning apparatus told Mr. Slawson that while humidity has no direct effect on the ink itself, air conditioning does affect favorably the way in which paper "takes" ink.

Speaking of the effect of air conditioning on rollers, another Chicago printer said his records show that during a run of 10,000 on a high-class monthly publication it was formerly necessary to stop the rollers and wash them five times during the run. Now the runs are completed

without any washups due to proper roller conditions and freedom from dust in the air which used to clog the rollers.

The American Printer article notes that engineers of York Ice Machinery Corp., after a study of printing difficulties caused by damp air, have shown that cellulose fibers of paper swell, causing the sheet to become longer and wider. When the moisture evaporates into the air, the sheet contracts, thus spoiling many printing jobs.

These are eliminated by use of air-conditioning equipment, it is said.

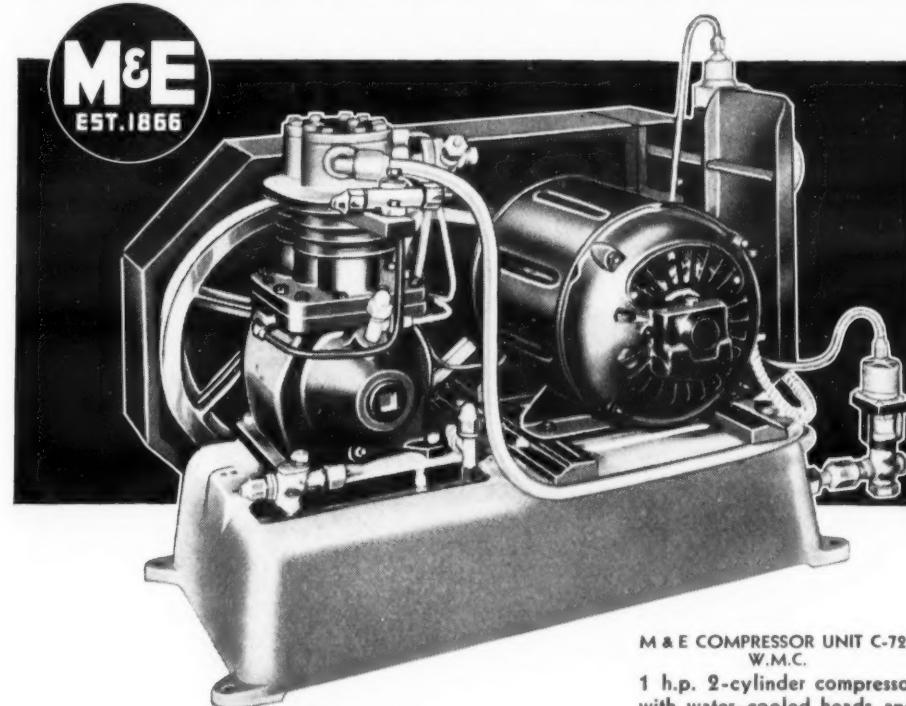
Changes in temperature can produce changes in relative humidity of from 65% to 6% in unconditioned pressrooms over a period of one month, York officials say. In August, Chicago's relative humidity frequently varies from 17% to over 90%, and it can change as much as 40% in one day.

It is also said that with a 30% change in relative humidity, a 38-in. sheet of coated paper will vary approximately one-sixth of an inch in size. With a humidity change of as little as 5% a 25-by-38-in. sheet will stretch as much as $\frac{3}{32}$ of an inch in 20 minutes.

If three colors of a four-color form have been run off, according to this article, stretching of paper will practically prevent registering the fourth color.

This situation explains, it is said, why "makeready" time in "natural weather" shops seldom complies with the time allowed by estimates or competitive bids. Largest return on an investment in air conditioning, engineers in printing plants declare, "will be from the decrease in non-chargeable hours caused by deformities of paper."

M & E COMPRESSORS are THOROUGHLY ENGINEERED



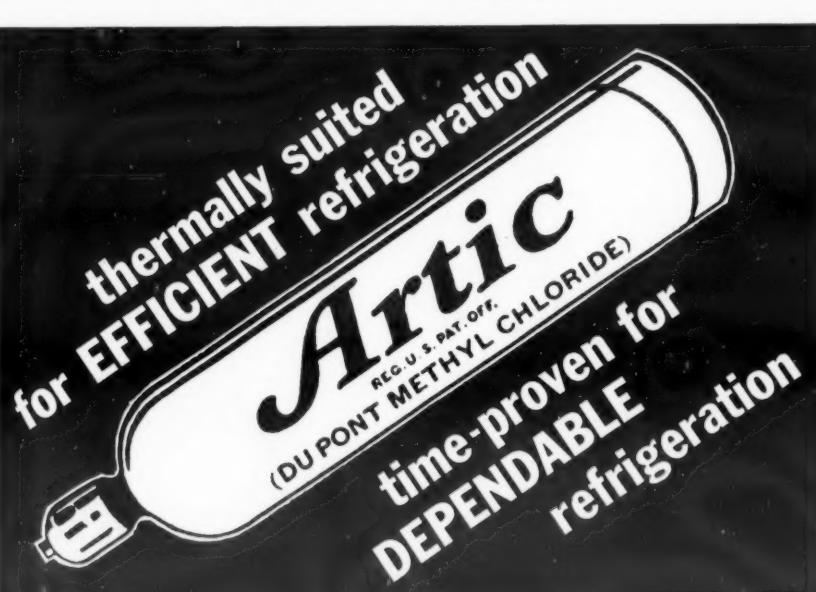
Good engineering is merely a matter of applied common sense.

Go over any M & E Compressor Unit and you will find feature after feature designed the way they are because each contributes some practical advantage in operation, maintenance and long life... There is an M & E Unit for every refrigeration need—forty-five models from $\frac{1}{4}$ h.p. to 20 h.p.—water or air-cooled—electric motor or gas engine driven. Write for Catalog.

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JUNE 23, 1937

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Monroe Doctrine— a New Statement

PROUDEST tenet of the foreign policy of the United States for many decades was the Monroe Doctrine—which said, in effect, that a closed season had been declared on territories of North, Central, and South America for foreign hunters, and that the United States intended to see that the “No Trespassing” sign was not violated.

In recent years this doctrine has become so well and widely accepted that it is almost a part of international law. South American resentment of its implied paternalism has eventually led to the use of a soft-pedal when this policy is mentioned, however. Nowadays we talk about the “Good Neighbor” policy toward South America, rather than the Monroe Doctrine.

But the time seems ripe for the statement of a new “Monroe Doctrine,” one of quite different character, one to apply right here in the United States. And this is, that the cities and towns of these United States are not open to invasion by hordes of vandals—masquerading under the guise of Organized Labor Defending Its Rights—from other cities.

Mayor Daniel Knaggs of Monroe, Michigan, first acted on this policy. Every newspaper reader knows how the thoroughly American mayor of this small city, aided by his aroused citizenry, successfully defied the C.I.O. and its threats of “marching on” Monroe. It is a story that will become an American historical classic; and Mayor Knaggs deserves to pass on up to bigger and better things in Michigan and national politics. If he does, we suggest that he campaign on a “New Monroe Doctrine” platform and slogan.

In Johnstown, Pennsylvania, where the workers apparently don’t want to be coerced into the C.I.O., either, and where acts of

terrorism have been entirely revolutionary, another embattled mayor, Daniel Shields, has also stuck up for his city’s rights.

But when the C.I.O. threatened to invade the town with one of its private armies (40,000 strong), Governor Earle, the New Deal Crown Prince, virtually ended the city’s autonomy by declaring martial law, and putting state troops on the side of the labor agitators.

It is perhaps significant that the two states which have suffered the most indignities in the current labor strife have been Pennsylvania and Michigan, the governors of which are both hopeful of succeeding to the Chief New Dealer’s mantle. Ultimate responsibility for the outrages in both states can be traced, it would seem, right back to the White House.

It is also significant, and infinitely encouraging, to note that in several scattered small cities, the people and their elected representatives have not lain flat on their backs while the C.I.O. rode rough-shod over them.

In addition to the Monroe and Johnstown examples, there was the famous Hershey, Pennsylvania, incident; and the one at East Lansing. In the latter case, the capital of Michigan was captured and held by C.I.O. mobs because an organizer’s wife had been arrested. Not only was law-and-order suspended, but all operations of the city as well. Stores were closed, streets blocked up by parked automobiles.

But when the C.I.O. Storm Troops went over to close up adjoining East Lansing, students of Michigan State College there threw them in the river. East Lansing stayed open. The bluff had been called.

When we examine the radical content and mob spirit so frequently prevalent in our biggest cities, those of us who cherish American ideals of freedom and independence are apt to become discouraged. But in the rock-ribbed Americanism of our small cities and towns there is hope.

What America needs is a New Monroe Doctrine. And more mayors like Daniel Knaggs of Monroe, Michigan.

QUOTED

THE AMERICAN GOVERNMENT IN ENGINEERING TERMS

“The writers of our Constitution seem to have foreseen the motorization of our government machine, and whether we like it or not, they have provided for three front-seat drivers—the executive in charge of the steering gear, the legislative in charge of the accelerator, and the judicial in charge of the brakes. When Congress steps on the gas and the supreme court on the brakes at the same time, the car won’t steer.

“Whether the remedy proposed by the driver, to disconnect the brake pedal from the brakes and connect it with the accelerator, is a proper remedy, it is our duty as citizens to form an opinion.

“But as members of the University we should insist that the headlights are as important a part of the equipment as any other, and the darker it is, the more we need headlights. Here is the function of the University.

“We want our headlights independent of our steering gear, and our brakes, and our motive power.”

—J. Duncan Spaeth, president of the University of Kansas City, addressing the Honors Day Convocation, University of Illinois.

LETTERS

For Those Studying The Trade-in Problem

Birmingham Gas Company
Birmingham, Ala.

Editor:

We are planning to make up a standard trade-in allowance on automatic refrigeration for our dealers, and would appreciate advice from you as to whether such information has been filed that might be used as a guide.

Any reference to this will be greatly appreciated.

G. W. LOEFFEL,
Residential Sales Manager.

Answer: A considerable amount of information has been published in various issues of AIR CONDITIONING AND REFRIGERATION NEWS this year.

Tabulated schedules on trade-in allowances have been published in two articles this year, namely:

“Trade Practices Code Set Up by Denver Dealers” published on page one of the March 17 issue of AIR CONDITIONING AND REFRIGERATION NEWS, and “California Plan on Trade-Ins Based on Arbitrator’s Bid for Used Boxes” published on page one of the April 14 issue of the News.

Other articles covering trade-in practices, published in various issues of AIR CONDITIONING AND REFRIGERATION NEWS, are as follows:

March 10, page 9—“Some Flint Dealers Say Consumers’ Power Trade-In Allowances Work Hardship; Others Defend Utility’s Policies.”

April 7, page 1—“Refrigeration Association of N. Y. Protests Gas Co. Allowances on Trade-Ins.”

May 12, page 1—“10% on Trade-Ins Is Maximum Under New Price Agreement.”

May 12, page 1—“El Paso Code Covers Trade-Ins, Discounts.”

May 12, page 6—“Local Norge Dealers Set Up Standard Scale of Trade-in Values.”

May 19, page 1—“Utica Association Sets Trade-in Maximums.”

June 2, page 1—“Denver Retail Code in Successful Operation After Revision to Meet Special Needs.”

June 16, page 2—“Trilling &蒙古 Sets Price Schedule & Fixes Trade-In Allowances.”

Back issues of AIR CONDITIONING AND REFRIGERATION NEWS are obtainable at a cost of 20 cents each.

How Can We Advise Prospective Purchasers?

1908 Hutchins Ave.
Rockford, Ill.

June 15, 1937

Gentlemen:

Are you in a position to state which in your opinion is the most economical as well as satisfactory (as to service) refrigerator on the market today?

Any information you can give as to tests or proofs, statistics, etc. will be greatly appreciated by a prospective buyer.

Thank you. G. CEDARLEAF

Answer: The problem of handling inquiries of this type has been discussed editorially upon several occasions (a clipping from the editorial page of the April 21 issue has been mailed to the above enquiring prospect).

We always feel a little worried because of our inability to furnish a satisfactory answer to prospective buyers who express a desire for factual information regarding the products of our advertisers.

We invite advice and suggestions regarding a practical method of solving this problem.

To a Student Who Wants A ‘Little’ Information

170 S. Seventh St.
Newark, N. J.

Sirs:

I would appreciate it very much if you would send me the following information about refrigerators:

History of the article, of its manufacture, of its uses.

Methods of manufacture: kinds of materials used, quality of materials used, cost of materials used, sources of materials used, available supplies of materials used.

Processes in manufacturing, location of factory, size of factory, kinds of machines used, kind of power used, methods of assembling, how finished goods are tested, union or non-union factory, sanitary conditions in factory, pay of workers.

Methods of packing: advantages of packaged goods, advantages of size of package, advantages of shape of package, packing special shipments.

Methods of transporting: methods

of transporting, transportation companies.

Style of product: trends in general styles, trends in special styles.

Uses of product: primary uses, secondary uses.

This information will help me a great deal in preparing a project in salesmanship. FLORENCE PALAIA

Answer: We would like to be helpful to you but the list of subjects you have given looks like a full year’s job for an experienced editor and three assistants.

A fairly good treatise might be prepared at a cost of about \$25,000.

After meeting the payroll, paying taxes and a few other items of expense incidental to a publishing business, we do not believe that we can spare the money for such a job. However, you might try Mr. Harry Hopkins, Washington, D. C. We understand that he is interested in all sorts of “projects” and that he has plenty of money to spend.

Since you are interested in “salesmanship” we would suggest that you study the methods used by President Roosevelt. He is the greatest salesman in the country today and we have noted that he does not bother about all these petty details regarding the operation of a factory.

We have enjoyed reading your letter. It reminds us of school days. Best wishes for your success.

He Wants the Books, Early or Late

St. Louis, Mo.
5012 Chippewa Ave.

June 9, 1937

Sirs:

With reference to your letter explaining the delay in sending the publications offered in your campaign some time ago, I feel that the time spent waiting will more than be well spent when the issue at last is made and delivered.

By no means do I want you to cancel my order, for delay or no I want my copy at your earliest convenience. I congratulate you on your splendid idea to divide the volume into smaller editions. These should prove both novel and more convenient for all concerned.

Your apologies are accepted and I regret that I am unable to aid you in this matter of speeding up your deliveries, until the issue comes I am sure we are all with you in this until the end. WALTER E. KOUNTZ

The Spread of Rural Refrigeration

All Steel-Equip Co., Inc.
Steel Office and Factory Equipment
Aurora, Ill.

Editor:

We are seeking information relative to the plan of rural refrigeration that is being adopted in some of the small towns through Iowa and adjacent territory.

Through this method, farmers and towns people rent a locker or compartment installed within the refrigerator room. This locker is equipped with a lock and the owner stores fresh meat and vegetables, removing same at his discretion. The units are rented, as we understand it, the installation ordinarily being owned by an individual, or in some cases there appears to be mutual ownership.

Our interest in this equipment comes as the result of our being manufacturers of standard steel lockers. We are interested in learning about the general type of refrigeration and particularly concerning the lockers, or compartments, which we are equipped to manufacture. Any data that you can give us on the subject would be very much appreciated.

F. R. McQUOWN,
Vice President.

Answer:

We have published a number of articles and news stories this year on refrigerated lockers as follows:

Feb. 10, 1937, page 11
Feb. 17, 1937, page 12
April 7, 1937, page 6
May 19, 1937, page 17
June 2, 1937, page 6

There is also a great deal of information about farm refrigeration systems and the locker system in the June 16 issue of AIR CONDITIONING AND REFRIGERATION NEWS, since this issue carries the report on the mid-year convention of the American Society of Refrigerating Engineers. A number of the papers read at this meeting dealt with farm refrigeration.

Tomorrow’s Newspaper

52 Brunswick St.
Newark, N. J.

Sirs:

I find your AIR CONDITIONING AND REFRIGERATION NEWS up to the minute and as fresh as tomorrow’s newspaper.

I want to be informed of everything going on in refrigeration. Kindly send me a list of the publications you have for sale such as specifications on refrigerators, etc.

CYRUS WITTER

The Red Book

Allgemeine Elektricitäts-Gesellschaft
1 River Rd., Schenectady, N. Y.
May 24, 1937

Editor:

We acknowledge with our thanks receipt of your letter of May 15th and of the “Red Book” advised therein. Be assured that this material meets with our keen interest.

N. E. GROENEVELD MEIJER,
American Representative.

Albert Pick Co., Inc.
2159 Pershing Rd.
Chicago, Ill.

Sirs:
We received your 1937 MASTER CATALOG OF AIR CONDITIONING & REFRIGERATION (the Red Book), for which we thank you.

We are quite sure it will be helpful to us in our daily business.

A. G. JENSEN,
Kitchen Equipment Manager.

Congratulations for the creation of a Master Catalog—the “Encyclopedia” we have always wished for.—Joseph Schreiber, 9329 Eberhart Ave., Chicago.

Another Vote

William Shaw
Publicity
141 West Jackson Boulevard
Chicago

June 15, 1937

Dear Mr. Taubeneck:
Here is another vote in favor of your publishing your travel articles in book form. Put me down for a copy when, as and if it is brought out.

WILLIAM SHAW

Crisp & Up-to-Date
Sparton of Canada, Limited
Critchley, Alta.

THE AIR AGE

BY F. O. JORDAN

Ilgattic Speaks

Ilg Electric Ventilating Co.
2850 N. Crawford Ave.
Chicago, Ill.

June 17, 1937

Air Conditioning Editor:

I have read your article on Comfort and Attic Ventilation in the NEWS for June 2. Needless to say, we disagree with what you have written practically 100%.

I believe it would pay you to read the paper given about two years ago by Prof. A. P. Kratz of the University of Illinois before the American Society of Heating and Ventilating Engineers, covering the research on attic ventilation. If you have not read the paper you will certainly get some surprises, and if you have read the paper, then it would seem to us as though you should send out an S.O.S. recalling practically everything you have written in your article of June 2.

Please understand that we are not entering a protest, nor do we want any publicity given to this letter. Most of the points that you put forward are not even open to argument because there are too many thousands of installations in operation that are regularly disproving almost everything that you have said. Also, please understand that this comment is not offered in the spirit of harsh criticism, but we do not like to see you or AIR CONDITIONING AND REFRIGERATING NEWS go on record with some information that is so far afield.

Incidentally, have you a good attic fan system in your own house? We will be willing to gamble that if you will allow us to put in an Ilgattic system for you, figured the correct way, that you will have no objection whatever to paying for it, and you will write us a testimonial besides. What do you say?

J. M. FRANK, President.

Answer: Thanks for your comments indicating 100% disagreement with our "Air Age" column of June 2. Some people must be reading the column after all. We hope most of them understand it better than you seem to.

Judging by your letter and your enclosure of testimonials from Ilgattic-happy customers, you seem to be trying to refute a statement that was not made. Air Age did not say that the attic fan is a flop.

The theme of the article to which you object was summarized in these closing words: "Attic fans have their place, but why not tell the truth about them?" Did you read that?

If all the air in a bedroom is replaced by outside air 30 times per hour (once every two minutes), it doesn't take an engineer to figure out

that the room will be kept at about the same temperature as the outdoors. Professor Kratz's experiments, to which you refer, and Detroit Edison's equally authoritative and disinterested tests by their Mr. Helmrich, bear out this truth.

Your own sales literature says "30 times an hour—the air in your home is replaced by cool evening air from out-of-doors. Before you know it, the whole house is as cool as the evening itself." (Of course, you mean almost as cool.)

All of this agrees practically 100% with the June 2 article, which says that the bedroom temperature may be reduced to within two degrees of your "cool evening air," if upward of 30 air changes are supplied.

But suppose the evening is not cool! Anyone who has sat on the old front porch and perspired all evening knows that summer evenings can be extremely hot and sticky.

And how can your "Ilgattic" circulator make the bedroom cool when the evening air is not? In words of one "syl-a-bul," how can one be cooled with hot air?

That, with ramifications, is what Air Age wants to know. Have you the answer?

There is no doubt that in many localities evenings are usually cool enough for economic justification of the attic fan. The June 2 article says, "Many summer nights are cooler than 78°. During such comparatively cool periods, the attic fan will serve its purpose."

Of course, noise and dust from the open window is often highly objectionable, as mentioned in the article in question.

If the advantages of attic fans are truthfully represented, selling them is a legitimate business. But Air Age objects to exaggerations which give the false impression that an attic fan will positively insure summer comfort, regardless of the weather.

Please read that article again. Then if you can specifically put the finger on any statement in it and say that it is erroneous, then maybe we can start an argument.

P. S. We already have two attic fans in our house, and we find them very helpful at times.

Spotlight on Parasites Of Air Conditioning

THE LETTER

Air Conditioning Editor:

Enclosed is a clipping from the Dayton Daily News and evidently reprinted from Scientific American entitled "Air Conditioning Parasites." This ties in with your recent article on attic fans . . .

It has occurred to me that users

of these so-called "attic fan air conditioners" might be designated under the general term "FAN-atics."

Once upon a time I heard a lecture by Dr. Myers who described an attic as a place where we put things that are not good enough to keep but are too good to throw away. Doesn't that just about fit the bill for the attic fan conditioners?

Your articles and chapters of your air-conditioning text book are very interesting and I hope to have a copy of this book as soon as it is released for publication.

C. D. MC LAUGHLIN,
226 Kenilworth Ave.,
Dayton, Ohio.

THE DAYTON DAILY NEWS ARTICLE

Parasites seem to be the rule rather than the exception in every line of endeavor. Let an honest development spring from the laboratories and immediately a group of imitators come forward with cheap, unreliable merchandise to foist on an unsuspecting public.

If only this stipulation can be extended to curb the other parasites in the same line, continues Scientific American, one more of our thriving industries will be freed from a handicap which inhibits the growth that is rightfully its own.

In view of this situation it is encouraging to learn that the Federal Trade commission has recently stepped into the picture and verbally spanked one manufacturer of an air "purifier" and circulating device. The commission has ordered that this company discontinue the use of the words "air conditioning" from their advertising, as well as the statement that the device . . . "accomplishes cooling effects of 8 to 10° F. lower temperature in summer."

If only this stipulation can be extended to curb the other parasites in the same line, continues Scientific American, one more of our thriving industries will be freed from a handicap which inhibits the growth that is rightfully its own.

THE COMMENT

Webster says that a fanatic is one who is "governed or produced by excessive or mistaken enthusiasm" . . . a visionary zealot."

Everybody knows that many a good cause fails because of the "excessive or mistaken enthusiasm" of its supporting fanatics, rather than through the opposition of sworn enemies.

Mr. McLaughlin would redefine "fanatic" as anyone who claims that you can keep cool all summer by installing a fan in the attic.

Incidentally, how about ideas and comments from more of you readers?

20-Ton Servel Unit Cools Worcester Restaurant

WORCESTER, Mass. — A 20-ton Servel air-conditioning unit with a 20-ton evaporator condenser has been installed in the New Yorker restaurant here, and a Servel drinking water system is to be installed in Mechanics National bank. At Lippe's Market, Southbridge, Mass., Servel refrigeration has been installed for refrigerators and counter cases.

R. W. Rollins, Servel distributor in this territory, reports increased demand for refrigeration and air-conditioning equipment.

National Lumber to Retail Delco-Frigidaire

ST. PAUL—National Lumber Co. has been appointed dealer for Delco-Frigidaire air-conditioning and heating equipment. Jay Axlerod is president of the company, and Martin J. Moffat will head the new department.

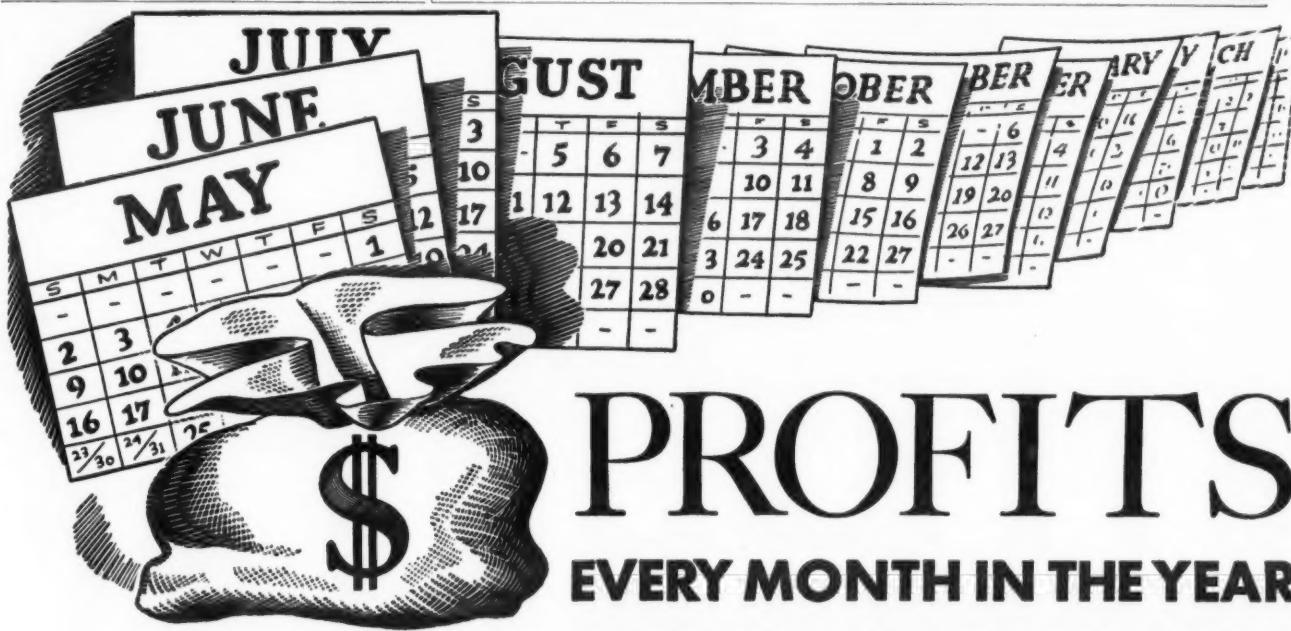
TRAINED MEN Furnished FREE!



Save time, trouble and money when you need men. Use the U.E.I. Free Placement Bureau. No charge to you or prospective employee. It is our contribution to the industry.

We have U. E. I. trained men available in all parts of the country. For 10 years our graduates have made good as shop mechanics, and as installation and service men in leading organizations. Next time you need a competent man, phone, write, or wire the U. E. I. Free Placement Bureau.

UTILITIES ENGINEERING INSTITUTE
404 N. Wells St. Established 17 West 60th St.
Chicago, Illinois 1927 New York, N.Y.



PROFITS EVERY MONTH IN THE YEAR AND FOR YEARS TO COME

This FRIGIDAIRE Electric Room Cooler is typical of present profit opportunities. There are more in use than all other makes combined.



Last summer Frigidaire Electric Room Coolers enjoyed a widespread public acceptance. Dealers who foresaw the demand for efficient low-cost cooling and stocked Frigidaire Coolers in time, sold out long before the summer was over . . . This year there is an even more active interest, that Delco-Frigidaire dealers will cash in on.

IN the past fifteen years there has been no greater business opportunity than that offered today by air conditioning—heating, cooling and conditioning of air.

The Delco-Frigidaire franchise offers a line of products that covers this field completely . . . right in price . . . right in engineering.

It offers national leadership in both heating and cooling.

It offers unusual opportunities for present profits.

But most important of all it offers the proven record of General Motors in taking its dealers to the top over the long-haul.

To the sound, conservative business man whom Delco-Frigidaire wishes to have as its "front-line" partner . . . this long-haul prospect—this chance to enter a soundly growing business—is particularly important.

There's room for a few more thoroughly qualified dealers in the Delco-Frigidaire organization. Mail coupon or write today.

Compare any other Franchise
with these

5 DELCO-FRIGIDAIRE ADVANTAGES

1 The power of the name General Motors . . . and the proven record of General Motors in taking its dealers to the top.

2 A complete line of heating and cooling equipment . . . offering such proven sales arguments as the Thin-Mix Fuel Control and "Controlled-Cost" Air Conditioning.

3 Right products at prices so competitive that no sale need be lost.

4 Accepted national leadership and widespread public acceptance.

5 Dominant and convincing advertising and sales promotion that tells a competitive story—both nationally and locally.

Write for more information
about this great Franchise

MAIL THIS COUPON TODAY

Delco-Frigidaire Conditioning Division,
General Motors Sales Corp.
Dayton, Ohio—Dept. ACRN-6

I am interested in your Franchise. Please send me complete information at once.

Name _____

Address _____

City and State _____

BRIDGEPORT Knows BELLOWS

What You See. A novel, flexible part which substitutes the durability of metal for less substantial materials at vital points in machine or instrument construction.

What You Don't See. The exacting analysis and control of alloys from the induction furnace to the finished bellows. Individual inspection to rigid standards of quality and performance, with close adherence to customers' requirements as to dimensional limits and physical characteristics. A complete engineering service of high calibre ready to work with each individual prospective bellows user to determine the particular bellows design and method of application which will most successfully serve his purpose.

No wonder manufacturers agree that "Bridgeport Knows Bellows"—and avail themselves of the plus quality which Bridgeport's unique service offers their products. Why don't you? Write for Bulletin FR. Bridgeport Thermostat Co., Inc., Bridgeport, Conn.

Bridgeport

DELCO-FRIGIDAIRE

The Air Conditioning Division of General Motors
AUTOMATIC HEATING, COOLING AND CONDITIONING OF AIR

G-E Stresses Cooperation with Architect & Contractor in Air Conditioning Merchandising

By F. O. Jordan

Editor's Note: This is the second of Air Conditioning Editor Jordan's interviews obtained at the factories of large eastern manufacturers. This article describes manufacturing, engineering, and merchandising methods used by General Electric Co.

BLOOMFIELD, N. J.—"We are convinced that the General Electric company's air-conditioning interests and those of the consumer may best be served by cooperating with architects, consulting engineers, and contractors. Such a cooperation is vital to everybody concerned with the selling, engineering, and satisfactory performance of air-conditioning installations," declares Elliott Harrington, engineer of the General Electric Air Conditioning Department.

When asked if General Electric attempts to design its air-conditioning products in such a way that the installation man's profit is reduced with a greater proportion of the profit going to the General Electric Co., Mr. Harrington's answer was an emphatic denial.

"Each of us fills a very necessary place in the air-conditioning business," he insisted. "We want both the architect or engineer and the contractor to get their rightful share of the profit.

"There is no philanthropy in this.

Our efforts are bent toward producing an efficient, finished product, and our achievement of this aim is the best possible gauge of the installation man's profits. As we succeed, we eliminate many of his headaches and profit-devouring readjustments. The greater the ultimate satisfaction of our common customer, the more business both of us will do.

"Any air-conditioning installation is so much of a tailor-made job that its eventual success is still—in many cases—dependent upon the contractor and engineer or architect after it has left the hands of the manufacturer."

As to the value to the manufacturer of the contractor and his good will, it was explained that the existence of able contractors to perform the work of installing equipment and systems removes a considerable burden from the manufacturer's shoulders.

A friendly contractor will also sell many installations for a manufacturer, because contractors of good standing in a community constitute the source of information to which many prospective buyers turn when contemplating an installation of their own. It was stated, furthermore, that friendly contractors are of great assistance to manufacturers who

cooperate with them because of their knowledge of an acquaintance with local codes and conditions.

In keeping with this avowed policy of cooperating with contractors, many of the G-E air-conditioning distributors and dealers have been selected from the ranks of contractors.

Recognizing that many contractors are often weak in salesmanship, the G-E company's air-conditioning heads nevertheless feel that practical ability and experience in installation work offset the weakness when bolstered by the sales support of the G-E distributor.

ABILITIES NEEDED

After the air-conditioning units have been fabricated in the factory, three fundamental operations must be performed before the result is more money in the manufacturer's pocket. The job must be engineered, the equipment must be sold, and finally it must be installed, together with essential piping, ducts, and electrical work.

The first operation requires engineering ability, the second merchandising ability, and the third contracting knowledge.

dealers who hold their exclusive territorial franchises within their classification direct from their distributor.

Each distributor and dealer has four departments, namely, sales, engineering, installation, and service. In large concerns these departments are separate, although the same individuals may function in more than one department in the case of smaller dealers.

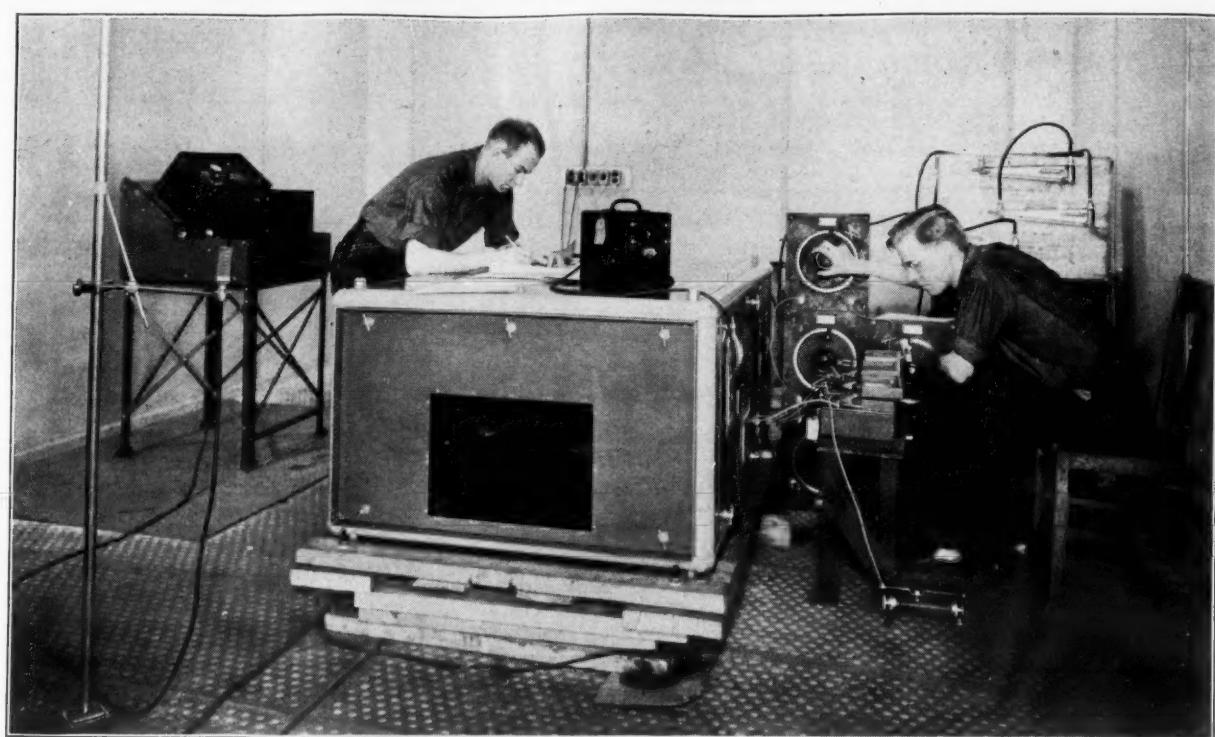
EDUCATION SERVICES

For training and instructing engineers and salesmen, the Air Conditioning Department of General Electric maintains three educational services, a training school which is conducted periodically at the factory, regional schools which are conducted by regional supervisors or factory experts at various points in the field, and correspondence courses.

The factory classes may extend over a period of several weeks, while the regional classes generally last only for a few days.

The purpose of factory schools is to thoroughly ground students in (Concluded on Page 13, Column 1)

Sound Testing in the General Electric Laboratory



Testing a General Electric air conditioner in the sound room of the air-conditioning development laboratory.



CONVERTED!

Here is the portrait of a service man who was "from Missouri" until he tried Wolverine Copper Tubing on one of his installations.

Now, he uses Wolverine Copper Tubing exclusively. Its dependable quality and uniform size makes a "right smart" installation, he says. So unusually soft that a fellow can work it with hardly any effort.

Wolverine Copper Tubing for refrigeration is made of 99.9% pure electrolytic copper, by a special annealing process and to ASTM Specifications. It is clean, thoroughly deoxidized, dehydrated, solder-sealed and crepe-paper wrapped so that it reaches you as bright and clean as the hour it was made.

ASK YOUR JOBBER
He carries a complete stock of Wolverine Copper Tubing for Refrigeration or Air Conditioning.

WOLVERINE TUBE CO.
1411 CENTRAL AVENUE
DETROIT, MICHIGAN



**COOL
REFRESHING
QUIET**

Air Conditioning

has passed from the luxury to the necessity class—faster, perhaps, than any single development in the last hundred years.

Even though this advance has been so rapid—

Century Squirrel Cage Motors were perfected and ready to do the right kind of a job for Air Conditioning while it was still in the early development stages.



Their Quiet Starting—Quiet Running—and Remarkable Freedom from Vibration help maintain Cool, Quiet, Refreshing Surroundings, wherever "business is done."

Be Cool and Comfortable! Do More Business and More Work—with Air Conditioning powered by Century Motors...They are dependable!

CENTURY ELECTRIC COMPANY
1806 PINE ST., ST. LOUIS, MO. • OFFICES AND STOCK POINTS IN PRINCIPAL CITIES

Century

PIONEER MOTORS FOR AIR CONDITIONING

Harrington Sees Hope for Reduction of Costs In Simplification of Application Engineering

(Concluded from Page 12, Column 5) G-E methods and equipment, while the object of regional schools and correspondence courses is foundation training and keeping field men up-to-date on improvements in both engineering methods and the product itself which result from continual development.

New men hired by dealers and distributors are first trained by the correspondence courses and regional schools after which they may be sent to the factory for the intensive finishing course given there. After this training the field personnel are kept advised of changes in methods, policies, and equipment through the regional schools and correspondence courses, and in addition, may return to the factory every year or so for instruction there.

COST REDUCTION

Mr. Harrington expressed the opinion that considerable saving in application engineering costs can and will result from development of simplified methods of making load estimates and equipment selection, especially for the "package" type of conditioner, as long as such methods include the effect of all factors whose influence is sufficient to justify their consideration.

However, he insists that the development of such methods must be based upon data and information collected from the carefully studied results of many installations, that simplifications in application engineering methods must not be adopted until they have been proved thoroughly.

It was explained that General Electric is constantly working on this matter, and that steps are taken as warranted by experience toward lightening the burden of the application engineer.

The management believes such steps to be most necessary as the growth of the industry continues, in order to ease the handicap to its development resulting from the continued shortage of trained men to do its work.

In this connection, J. J. Donovan, manager of General Electric's Air Conditioning Department, declares

that this persistent shortage of men who are equipped with the training necessary to carry on the expansion of the air-conditioning industry constitutes its greatest handicap.

As an indication that the application engineering methods of the air-conditioning industry as a whole are crystallizing gradually into a state of simplified standardization, Mr. Harrington pointed out that competitive estimates and recommendations no longer vary to the disconcerting and customer-discouraging extent of a year or two ago.

At that time it was not uncommon for a prospective buyer to be convinced by the wide variation in recommendations and estimates that the industry was yet too new to know its own business.

PUBLIC ACCEPTANCE

As to public acceptance of the air-conditioning industry's products, Mr. Harrington declared that although public desire for air conditioning is undoubtedly and very general, the greatest sales resistance to be overcome in selling the customer, especially in the domestic field, is his general wish to wait a few years until selling price of the product has been reduced by the magic wand of mass production, and until radical and unheard-of cooling cycles have been discovered.

In this tendency he insisted that the public is making a serious error because, contrary to public opinion, air conditioning and refrigeration are relatively old industries whose laws have been known and practiced for a long time, so that any technical change in its products to be expected will be in the nature of gradual year-to-year development rather than in drastic and revolutionary changes.

It was explained that any great reduction in selling price due to increase in production rate is improbable, because of the fact that the labor cost, which is the only portion of the consumer cost susceptible to any appreciable reduction from volume production, forms only one fifth to one fourth of the total cost.

In substantiation of this statement, Mr. Harrington pointed out that there has been a general rise in air-

conditioning prices this year, even though some savings have been effected by simplified product designs which lend themselves to reduced costs of fabrication and by improved production methods and increase in volume.

The explanation of this persistent rise in price, even in the face of improved methods and volumes, lies in the present tendency for any saving due to improvements in product design and in production volume and methods to be more than offset by rising material and labor costs. For these reasons during the next few years the public may pay more for air conditioning than it does at present, Mr. Harrington concluded.

York Equips Ford Assembly Plants at Memphis, St. Paul

MEMPHIS, Tenn.—York air-conditioning equipment has been installed in the Ford branch assembly plants here and in St. Paul.

Four other Ford branch assembly plants previously air conditioned by York are those in Somerville, Mass., Chester, Pa., Edgewater, N. J., and Kansas City, Mo.

Airtemp Equipment Used In Wichita Club

WICHITA, Kan.—A \$4,000 air-conditioning system is being installed at the 400 Club here by Midwest Airtemp Corp.

Recently completed by the Midwest company was installation of conditioning equipment in ABC Beauty & Barber shop in the Uptown theater building.

Denver Climate Permits Use of Evaporative Cooling With Refrigerated Water for Apartment House

DENVER—Taking advantage of the prevailing dry atmosphere of this climate, York Ice Machinery Corp. has put "evaporative cooling" to work helping mechanical refrigeration to air condition the new Skyline Apartments located on the eighth and ninth floors of the local Brown Palace hotel.

Evaporative cooling is the name given to an arrangement well known to all air-conditioning engineers in which the sensible heat absorbed by evaporating water is used to cool the air supplied to an air-conditioned space. In this method of cooling, the air stream is passed through a water screen which has been broken up into a fine mist or fog by the action of pressure atomizing sprays.

Due to the intimate contact between air and microscopic particles of water, a rapid evaporation of moisture results. According to thermodynamic law, the sensible heat required to evaporate the water is absorbed from the surrounding air, thus reducing its temperature, the moisture evaporated being absorbed by the air as latent heat, so that the humidity of the air is raised.

Since the sensible heat removed from the air is exactly equal to the latent heat absorbed by the air, the total heat content of the air remains the same, hence the name, "adiabatic cooling."

Since the adiabatic way is a very economical method of cooling air, it doubtless would enjoy universal use but for the fact that the resultant rise in humidity level may make the air-conditioned space more uncom-

fortable than before, except in climates where the air is very dry.

In the Skyline Apartment installation, York has used a conventional air washer to obtain the adiabatic or evaporative cooling effect, which they augment by the use of a refrigerating unit to cool the spray water. It is said that a result of this combination of cooling methods has been to reduce the size of the refrigerating equipment required, and operating costs as well.

For the purpose of enabling the occupants of the various rooms to regulate the temperature of the air entering their room to suit their individual tastes, the air-supply grille to each room is provided with a manually controlled air-regulating damper.

The system is used also for winter conditioning by heating the air supply as required by means of steam coils at the air-washer location.

The central station air-conditioning and circulating equipment is located in a penthouse on the roof. This equipment includes refrigerating machine, air washer, air filters, supply fan, direct-expansion coils with expansion valves, etc. A rock-wool insulated duct system is concealed above suspended ceiling for air distribution.

The system has a connected electric load of 37½ hp., consisting of 25-hp. compressor motor, 7½-hp. water-circulating pump motor, and a 5-hp. fan motor.

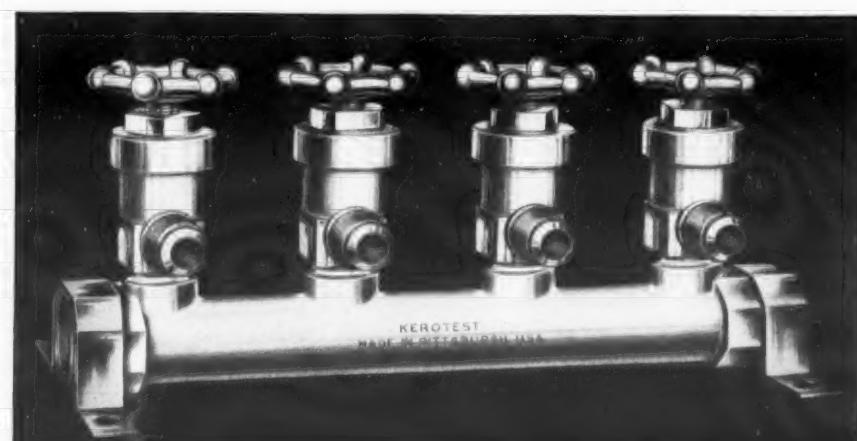
Total cost of the installation is placed at \$19,880.

KEROTEST



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ARE ACCEPTED AS
STANDARD BY
THE LARGEST
MANUFACTURERS
OF REFRIGERATING
EQUIPMENT IN
THE WORLD!



On sheer merit alone, Kerotest Valves, Fittings and Accessories have won the recognition of leading manufacturers of refrigerating equipment. This highly valued recognition is the reward of years of constant technical improvement—years of adherence to the strictest quality standards in the face of severe price competition.

Ever since the first valves were shipped, the cardinal principle of Kerotest refrigeration valve manufacture has been superior performance to the ultimate user—a responsibility which many equipment manufacturers have been pleased to entrust to Kerotest.

Today this confidence and trust is zealously guarded. To every user of Kerotest products,

the name is a guarantee of long, dependable performance in the severest refrigeration service.

Among the many preferred Kerotest products is the Kerotest line of Tinned Forged Steel Manifolds—guaranteed not to season-crack or split due to temperature changes or the wedging action of taper pipe threads. Equipped with Diaphragm Packless Valves, they assure the last word in refrigerant control for large commercial installations.

You will find warehouse stocks of Kerotest Products readily available through Kerotest Jobbers in every important industrial center.

KEROTEST MANUFACTURING CO.
PITTSBURGH, PA.

ANACONDA COPPER REFRIGERATOR TUBES

MAKE the success of your installation jobs more certain by using these tubes from "copper headquarters". More than a century of manufacturing experience is behind the name "Anaconda".

The precision methods of The American Brass Company give these tubes the uniformity necessary for efficient installation. Each and every length of tube has the same unusually bright, clean inside surface. Manufactured according to

A. S. T. M. specification B68-33. Deoxidized. These quality tubes are 99.9% pure copper, deoxidized to increase corrosion-resistance and improve physical properties.

Unusually soft. Anaconda Copper Refrigeration Tubes are easy to bend and may be flared without cracking.

Anaconda Copper Refrigeration Tubes meet the leading refrigerator manufacturers' specifications in every way. They are carried in stock by distributors of refrigerator parts.

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How to Select and Install Air Conditioning Systems

CASE NO. 20

A Haberdashery

By T. H. Mabley

There are many cases where it may be possible to use a single suspended-type unit to air condition a regularly proportioned small store space. Such an establishment is illustrated in Fig. 1, a haberdashery shop with a sales floor approximately 50 feet long and 30 feet wide.

At the rear of the store an additional space 20 feet by 30 feet is used for stock room. This is separated from the sales space by an 8-foot high partition, thus leaving an open portion about 4 feet high between the top of the partition and the ceiling.

The sales floor is perfectly regular and unobstructed by columns, low beams, or irregular and protruding fixtures.

The space does not handle a high occupancy concentration. The store is located in a single story block of stores.

For this particular job air conditioning will mean primarily summer cooling. This involves the use of refrigeration equipment to reduce the temperature to a comfortable condi-

tion when the outside temperature is near the maximum.

During mild weather some cooling may be accomplished by means of ventilation. In addition to summer temperature control, the system must carry out the functions of circulation and filtering. The latter is particularly important in this case as filtering should reduce the normal spoilage losses due to dirt and dust that leaks into the sales and stock space with the infiltration of outdoor air.

The present heating system is adequate; however, a coil will be included to temper the air that is introduced into the space by means of the air-conditioning equipment.

Design conditions can be determined in the usual manner. For the particular locality 97° dry bulb and 77° wet bulb are the accepted outside design air conditions. For an establishment such as the one under consideration a temperature reduction of about 15° should give the ultimate satisfaction under the maximum outside conditions. With 82° temperature inside the conditioned space, a relative humidity of 45% should be maintained for real comfort.

With these conditions it will be necessary to maintain the inside air at a moisture content of 74 grains per pound when the outside air has a moisture content of 108 grains per pound which figure is the absolute

humidity for the outside design conditions.

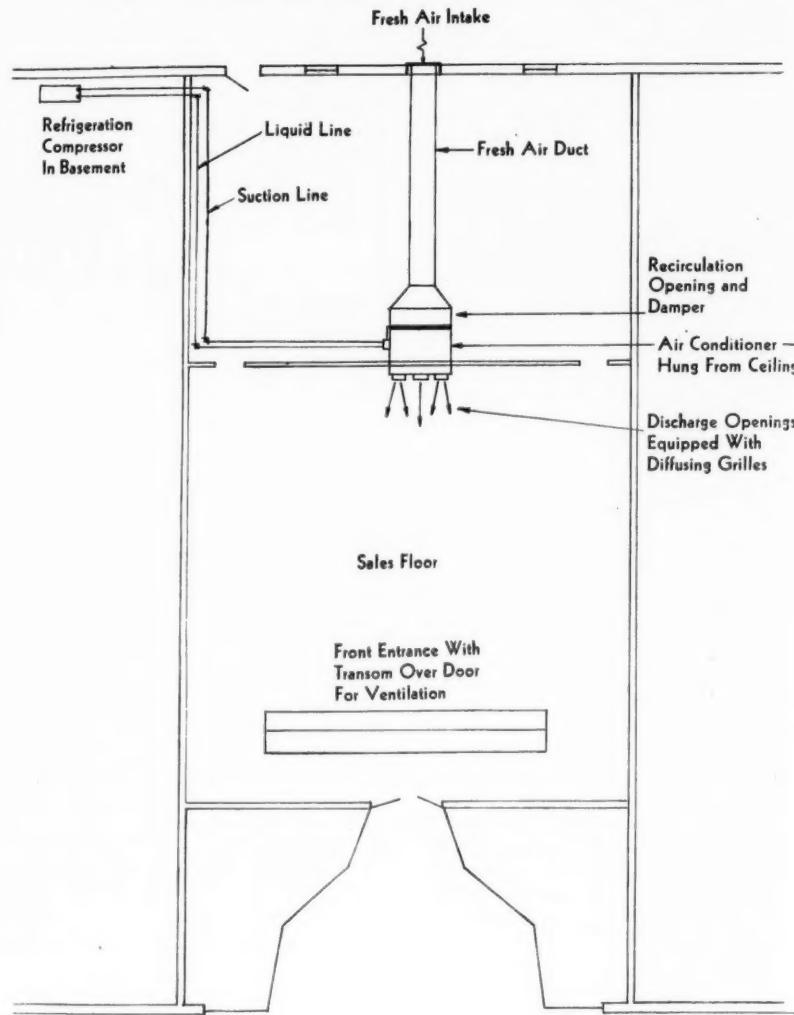
Normal infiltration into the conditioned space might be as high as 1½ air changes. To assure that we will be able to maintain a slight infiltration we will use a design figure of two air changes or 760 c.f.m. for the fresh air load under maximum conditions. This air should be introduced into the store by means of the air-conditioning equipment to assure the proper functioning of the filtering equipment.

In the detailed summary of the heat load calculations it will be noticed that the largest proportion of the building load is through the roof. This is due to the fact that the building is a one story structure and the sun beats directly on the flat roof.

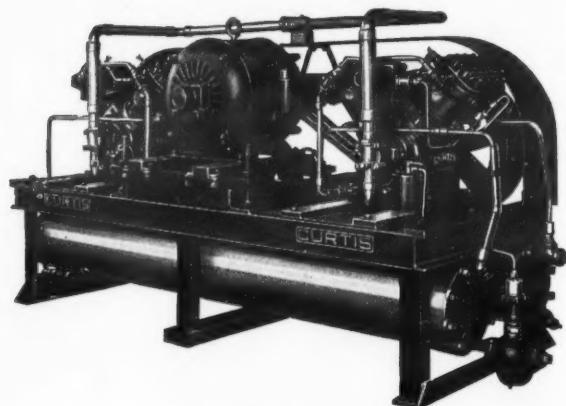
Before the installation is actually made serious consideration should be given to some means of reducing this source of heat gain. There are several ways to reduce the sun effect on roofs. Insulation is in many cases the most satisfactory as its heat flow resistance is an asset in both summer and winter.

It is usually possible to reduce the heat flow through a roof such as this from one-third to one-quarter of the loss or gain of the uninsulated roof by the proper use of

Single Suspended Conditioner in Small Store



In Air Conditioning



YOU CAN ALWAYS DEPEND ON CURTIS

Curtis engineering created the patented "Centro-Ring" system of positive pressure oiling with no wearing parts. Curtis designing includes

1. Timken Tapered Roller Main Bearings
2. Water jacketed compressor heads and cylinders
3. Drop forged heat-treated crank-shafts and rods
4. Built-in oil separator with automatic return and automatic water valves
5. Precision manufacture throughout the entire unit

86 Air Conditioning units in the complete Curtis line from 1 ton to 30 tons.

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CURTIS REFRIGERATING MACHINE CO.
Division of Curtis Manufacturing Co.

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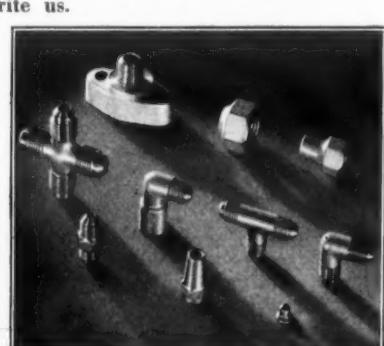
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REFRIGERATION
AIR CONDITIONING
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PERFECTION REFRIGERATION PARTS CO.
(A division of Perfection Gear Company . . . Established 1919) HARVEY, ILLINOIS

Heat Load Calculations

HEAT GAIN

Sensible

Conduction	
Side Walls—1,440 sq. ft. \times .40 \times 15°	8,640 B.t.u.
Front Partition—30 sq. ft. \times .80 \times 25°	6,000 B.t.u.
Rear Wall—320 sq. ft. \times .46 \times 7½°	1,104 B.t.u.
Rear Windows—40 sq. ft. \times 1.13 \times 7½°	339 B.t.u.
Front Door—60 sq. ft. \times 1.13 \times 15°	1,017 B.t.u.
Roof—1,800 sq. ft. \times 20 B.t.u./sq. ft.	36,000 B.t.u.
Floor—1,800 sq. ft. \times .34 \times 10°	6,120 B.t.u.
Infiltration—2 Air Changes: 760 C.f.m. \times 1.03 \times 15°	11,742 B.t.u.
Occupancy—20 people \times 220	4,400 B.t.u.
Light Load—4,000 watts \times 3.4	13,600 B.t.u.
Total Sensible Load	88,962 B.t.u.

Latent

Infiltration—760 C.f.m. \times .64 \times (108—74) grains	16,538 B.t.u.
Occupancy—20 people \times 180	3,600 B.t.u.
Total Latent Heat	20,138 B.t.u.

Total Heat Gain

Sensible Heat

Ratio $\frac{.815}{.815}$ Total Heat

Heat Load for Tempering Coil—760 C.f.m. \times 1.03 \times 70° \dots 54,796 B.t.u.

this method. In this case such a saving would represent quite an item and should definitely be considered.

Another way to reduce the heat gain through the roof from solar radiation is by spraying the roof with the water from the condenser of the refrigeration system. This requires that the roof be perfectly water tight and constructed to withstand this excess water.

Ventilation of the space between the roof and the ceiling is another method often used, but in this case would be impossible due to the shallowness and the inaccessibility of the space.

It should be noted that in the heat gain calculation a 15° temperature difference between the conditioned space and the adjacent stores on both sides was used. This value was selected because it is expected that the adjacent stores which are not air conditioned will naturally be as warm as the outdoors under maximum conditions due to the nature of their business.

In allowing for the stock room it would be incorrect to assume that

this space would be either maintained at the same temperature as the conditioned sales space or be at the same temperature as outdoors.

For the purpose of approximate load calculations we will assume that the stock space conditions will be a compromise between indoor and outdoor conditions. We will therefore assume that the average temperature differential between the outside and the stock space is 7½° F.

In figuring the wall and floor areas we used just half of the actual area and included that amount in the calculations for the main body of the store which was figured at 15° differential.

Next step is to select the equipment for the proposed installation. From the manufacturer's performance data we can select a standard ceiling-type suspended unit which will handle a volume of approximately 4,000 c.f.m.

This volume of air will provide us with a little more than 10 changes of air per hour in the conditioned space, which should be adequate for comfortable circulation. This unit will give the required cooling performance at 50° refrigerant gas temperature.

The unit selected will be complete with a squirrel cage triple-unit blower, direct expansion cooling coils, (Concluded on Page 15, Column 1)

Refrigeration PARTS & TOOLS

Bracket strips
Bracket adapters
Flange adapters
Clamps
Tee wrenches
Pinchoff tools
Flaring tools
Tube benders
Valve needles
Replacement shafts

Above is only partial list of parts and tools which we manufacture and sell thru legitimate jobbers.

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ASK FOR NEW
BULLETIN 144C
"T" Series Thermo Valves

ALCO VALVE CO., Inc.
ST. LOUIS, MO.

Mabley Gives Detailed Procedure in Sizing Refrigerant Lines

(Concluded from Page 14, Column 5) single row steam heating coil for tempering duty, and a cleanable type filter.

The conditioner should be hung from the ceiling, or, if necessary, a stand may be constructed to support the unit from the floor. With either method of support some provision should be made to isolate any vibrations generated within the unit from the building structure. This is usually done most successfully by means of spring or especially designed rubber supports.

The refrigeration compressor will have to be located in the basement below the adjacent store. This will necessitate longer refrigerant lines than might normally be expected. For this reason we will give more serious consideration to the selection of the refrigerant pipe sizes.

In previous cases two methods for the selection of refrigerant pipe sizes have been illustrated. We will now use a slightly more detailed method.

Since we are using Freon as a refrigerant in this particular case we must refer to a table of the thermodynamic properties of the gas as prepared by the manufacturer. From this table we can arrive at the total heat in the gas at 42½° pressure and 7½° superheat which are the suction line conditions in our particular case. This amounts to 84.07 B.t.u. per pound.

If we subtract from this value the heat content of the liquid refrigerant at 116.9 lbs. pressure and 100° temperature which is 31.16 B.t.u. per pound we can arrive at a figure for the total heat per pound absorbed by the refrigerant in the evaporator (cooling coil). This difference amounts to 52.91 B.t.u. per pound and if we divide this figure into our total cooling load we will find that it is necessary to circulate 2,006 pounds per hour to give to total required cooling effect.

We can convert this figure to pounds per minute and by use of the specific volume of .774 cubic feet per pound we find that we will circulate 25.9 cubic feet of refrigerant per minute. By simple process of arithmetic we can find out what area pipe will be necessary to pass this volume of gas at a velocity not to exceed 2,200 feet per minute. In this case we find that a 1½ inch inside diameter pipe will give velocity slightly more than 2,000 feet per minute.

The same method is used in selection of the liquid line size. We already know how much refrigerant is being circulated, and using the specific volume of the liquid refrigerant we can select a pipe having an area sufficient to pass the liquid at velocity of approximately 150 feet per minute.

In cases involving a very long refrigerant run, reference should be made to a pressure drop curve for various liquid and gas velocities.

20 Air Conditioning Makers Exhibit at Portland Show

PORLAND, Ore.—Some 20 Northwestern manufacturers of air-conditioning and home appliances recently cooperated to show dealers the new lines. Exhibit was staged at the Multnomah hotel.

Among the different brands displayed was the Montag line, its finishes running through 17 different colors.



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BOOKS AVAILABLE

(Send order for these books with cash remittance to Business News Publishing Co., 5229 Cass Ave., Detroit, Mich.)

THE MASTER SERVICE MANUALS

The Master Service Manual by K. M. Newcum, known to service men as the book that gives the "What to do" and "How to do it" for all types of household refrigeration systems, has just been revised by the author and has been split up into three smaller "Manuals."

Manual No. 1 includes the chapters on the theory and principles of refrigeration, the chapters outlining the characteristics of refrigerants, and the chapters describing the construction and operation of condensing units, evaporators, controls, and motors. Price, \$1 a copy.

Manual No. 2 describes the installation methods, service complaints, and service remedies for each of the common types of household refrigeration systems. A step-by-step outline of the various service operations is given. Price, \$1 a copy.

Manual No. 3 gives specific service instructions for certain makes of refrigerators no longer being manufactured, which are of such design that special service instructions are necessary. Price, \$1 a copy.

REFRIGERATION AND AIR CONDITIONING SPECIFICATIONS

The first comprehensive compilation of key specifications for all models and makes of household and commercial refrigeration equipment and air conditioners through 1936.

This 512-page book was designed primarily for the use of service men in identifying operating characteristics and specifying replacement parts.

For example, it offers such pertinent data as the oil and refrigerant charge, belt size and compressor model number. Then it also tells the make and type of such component parts as controls, motor, evaporator, and condenser.

The book will also prove valuable to dealers and salesmen in establishing trade-in values on used electric refrigerators.

In addition to the specifications of all models of all makes of the Refrigeration and Air Conditioning Specifications Book offers a brief corporate history of all companies that have manufactured electric refrigeration equipment. Price of the book, \$3 per copy.

THE REFRIGERATION ENGINEER'S MANUAL

The Refrigeration Engineer's Manual, written by S. L. Potts, is a guide for the installer and operator of large-size refrigeration systems for industrial-type applications. It covers the selection, installation, and maintenance of all types of systems, and explains how to figure the sizes and capacities of various systems.

More than 100 diagrams and pictures are used to give the reader a thorough understanding of the subject. Many tables are included for handy reference purposes.

One of the most useful chapters in the book is one which lists the common service operations on the compression-type system, and describes in detail the proper methods of performing these operations.

The Refrigeration Engineer's Manual is thoroughly indexed as to subjects, definitions, formulas, illustrations, and tables, making its valuable data easily available for reference. Price, \$3 per copy.

AIR CONDITIONING SURVEYS

Air Conditioning Surveys is an 84-page booklet summarizing installations of air-conditioning equipment to date in 55 U. S. trading centers. The information tabulated in this

book was obtained through the cooperation of power companies that keep records on air-conditioning installations.

The information contained in the booklet tells what types of places are buying air conditioning, indicates the sales progress made in the past two years, and for a number of cities gives the name and address of the place in which each installation was made, make of equipment installed, and the size of the installation in terms of cooling capacity. Price of the booklet, 50 cents.

Low Cost Stressed in Drive For Air Cooler Sales

(Concluded from Page 1, Column 3) benefits of air conditioning this summer, and are designed to sell the idea of air conditioning as well as the merchandise itself.

The advantages of air conditioning in comfort, health, and efficiency are stressed in the newspaper series, and the public is invited to inspect the complete room cooler display at the utility's headquarters.

At strategic heavy traffic points, a "flash" reminder billboard message will be placed before prospects, and three local radio stations will carry daily reminders as to the comforts of air conditioning as temperatures given. Price, \$1 a copy.

Next step in the campaign is a direct-mail "proof" sheet, with the prospect's name printed as part of the message, telling him how comfortable he and his family will be during the hot summer months, if they install air conditioning.

Two "proofs" are shown in the direct-mail message, the first of low operating cost, by citations of actual electric bills in air-conditioned homes, and the second of acceptance, by photographs and letters of endorsement from users of the equipment.

Enclosed in the mailing piece is a postcard which the prospect can use to have a utility representative call on him with additional information regarding the application of air conditioning to his home or business.

Direct-mailings will go to a select list of prospects, based on purchasing power, and cooperating dealers can have their own individual prospects added to the list, if they are not originally included.

To prospects where dealers have definitely scheduled sales action, Union Electric will write a "back-up" letter, assuring the prospect that air conditioning is practical, and that it is inexpensive to operate under present low rates. All-season cooling may be had for less than \$25 down to as low as \$12.50, the letter will point out.

Individual dealer's letters will be worked out between the dealer and Union Electric Co. so as to bring to attention the points on which most interest has been evidenced.

Obert Named Assistant Airtemp Sales Head

DAYTON—Appointment of F. C. Obert as assistant general sales manager of Airtemp, Inc. has been announced by A. C. Downey, president. Mr. Obert, formerly Airtemp's regional manager here, has been succeeded by J. C. Chambers.

President Downey also has announced appointment of the following distributors: Griffith Consumer Co., Washington, D. C.; Pierce Phelps Co., Philadelphia; Garrison Engineering Co., Jacksonville, Fla.; Wilcox Engineering Co., South Bend, Ind.; Mehrling & Hansen Co., Chicago; Indiana Temperate Air Co., Indianapolis; Ulster Distributing Co., Kingston, N. Y.

"FINER THAN FROG'S HAIR"

One thousandth of an inch isn't much—not until you get into delicate mechanisms such as thermal expansion valves. Peerless valve parts are machined to one thousandth of an inch by skilled workmen on modern machines.

The result is a highly dependable product such as the Model 70 Valve Bill Becker has in his hands here. Bill, by the way, is "headman in charge of seeing that valve parts are machined as they should be." And there's none better.

This model 70 Valve is designed specifically for Air Conditioning Work and large commercial installations. Capacity for Freon is 25 tons; for Methyl Chloride, 35 tons. Capacity for satisfactory service—unlimited.

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Established in 1912 as the Peerless Ice Machine Co.

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THE BUYER'S GUIDE



BARE COMPRESSORS and COMPLETE UNITS

All types for service replacement and new installations . . . One, two and four cylinder models from $\frac{1}{4}$ h.p. to 20 h.p. . . . For Sulphur Dioxide, Methyl Chloride or Freon. Write for new catalog—a valuable reference for assemblers and service companies.

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Filtrine

EFFICIENCY

FILTERS & COOLERS

WATER COOLERS

COMMERCIAL — AIR CONDITIONING

From 2 gals. per hour to 500 gals. per minute

WATER FILTERS — STEEL PIPE COILS — SURGE TANKS

FILTRINE MFG. CO., Brooklyn, N. Y.

Gilmer

GIVES YOU SPEEDY V-BELT SERVICE . . .



Go to Gilmer jobbers for quick service everywhere, always. Immediate deliveries. Full stocks always on hand. No time lost, no customers lost. Better go to Gilmer.

L. H. GILMER CO., Tacony, Philadelphia
The Oldest Firm of Rubber Fabric Belt Specialists

"SLICK" MOTION! INSURES RAPID HEAT TRANSFER

You'll marvel at the "slick" motion of the refrigerant in Manufacturers Fin Coils equipped with THERMO FIN In Tube—the patented improvement. It swirls up one wall and down the other like a bobsled on an Olympic course increasing the effective surface of the fin coil. It really is a "slick" idea, you'll readily agree.

MANUFACTURERS FIN COIL CO.

CHICAGO, ILL.



"THE WHOLE TRUTH— and nothing but the truth"



WHEN the pointer of a Marsh Ammonia Gauge comes to rest you can rely on its testimony . . . and, thanks to the Marsh Recalibrator, you can **KEEP IT HONEST!**

When a Marsh gauge is knocked out of adjustment you don't pull the hand off and set it back to zero—a practice that merely corrects a gauge at the zero point and fails to correct it at other points.

All that you do is simply turn the Marsh Recalibrator screw until the gauge is

correct at zero, and this patented feature

resets the gauge throughout its entire

range—truly re-calibrates it.

These Marsh gauges for refrigeration work have many other superior features such as the patented stabilizer that protects

against sudden shock, and the patented dial arrangement which provides easily read 1 lb. divisions in the low pressure operating

range.

Write for complete information about these gauges and other

Marsh instruments.

JAS. P. MARSH CORPORATION
2067 Southport Avenue, Chicago, Ill.

MARSH Refrigeration Instruments

Air Conditioning Made Easy—By F. O. Jordan

Use of Charts in Correlating Test Data on Air Conditioning Coils

SECTION NO. 16 (Cont.)

Test Data

Correlating Data

By properly correlating the fundamental coil data which has been obtained as described above, tendencies and influences may be determined, and coil performance may be predicted for conditions other than those at which test runs were made. Two methods of accomplishing this result will now be shown.

In the case of a given direct expansion air-conditioning coil, the factors which govern performance are air velocity, average refrigerant temperature, and dry-bulb and dewpoint temperatures of entering air. In the case of the water-cooled coil the governing factors are air velocity, entering and leaving water temperatures, water velocity, and dry-bulb and

dewpoint temperatures of entering air.

If the coefficient of conductivity per degree of mean effective temperature difference of the coil is known, the sensible capacity may be computed. However, if capacity is to be for different conditions, the influence of air velocity, and other variable factors, upon the coil coefficient must be known.

As stated above, the influence of each factor may be determined by test, if runs are made in which the one factor is varied systematically, while all other influencing factors are held constant.

Figs. 82, 83, and 84 show the results of a series of test runs upon a coil through which chilled water was circulated. To obtain the curve shown by Fig. 82, tests were run in which the air velocity was varied, so that the influence of air velocity was determined. To obtain the curve shown by Fig. 83, test runs were made in

which water velocity was varied.

For both series of runs, the dewpoint of entering air was held below the temperature of the water within the coil, so that there was no latent work being done.

Finally, Fig. 84 was obtained from a series of runs in which the rate of latent work was varied by varying the differential between dewpoint and average water temperature, the dewpoint being above water temperatures at all times.

To obtain the points in the coil coefficient curve shown by Fig. 82, the sensible work done at a given condition is obtained by one of the methods described above, and the actual mean effective temperature difference is determined from Fig. 85, by noting the difference between entering air and leaving water, and between leaving air and entering water.

The coefficient is then determined by the following equation:

RS

$K = Btu/hr./^{\circ}Mtd/sq. ft. Rad. Surface$

$K = B.t.u./hr./^{\circ} Mtd/sq. ft. RS$

HS=Sensible work done per hour.

RS=sq. ft. of radiating surface.

MTD=Mean effective temperature difference.

The three curves shown by Figures 82, 83, and 84 may be plotted from the results of about 15 test runs. After the curves have been plotted, the sensible capacity of the coil at any other condition may be computed by the following equation:

$HS = K \times RS \times MTD$

where the symbols are as listed above.

"K" is obtained by choosing a "K" value from Fig. 82 according to the air velocity, then multiplying it by the proper per cent as taken from Fig. 83, depending upon the water velocity, and finally multiplying the result by the proper factor as taken from Fig. 84, depending upon the difference between the dewpoint and the average water temperatures.

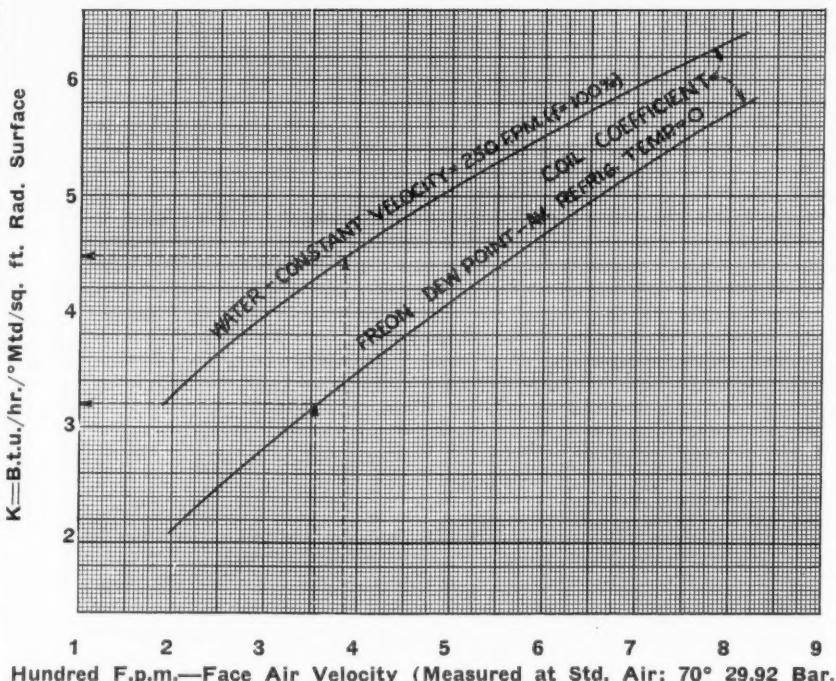
The value of RS must of course be known, while a tentative MTD

must be obtained from Fig. 85 by assuming final air and water temperatures. The final temperature necessary to obtain the capacity indicated by working out the equation with the assumed MTD, must agree with the final temperatures assumed in obtaining the tentative MTD.

Generally there will be no such agreement upon the first attempt, so that a new tentative MTD must be

(Continued on Page 17, Column 3)

Effect of Variable Air Velocity on 'K'



Hundred F.p.m.—Face Air Velocity (Measured at Std. Air: 70° 29.92 Bar.)

Fig. 82—This chart shows the coefficient for a particular coil at various air velocities when the water velocity is 250 f.p.m. or greater. RS (radiating surface)=sq. ft. of face (radiating surface)/sq. ft. of face area/rows deep=20.75 sq. ft.

Counterflow M. T. D. Chart (Cooling Only)

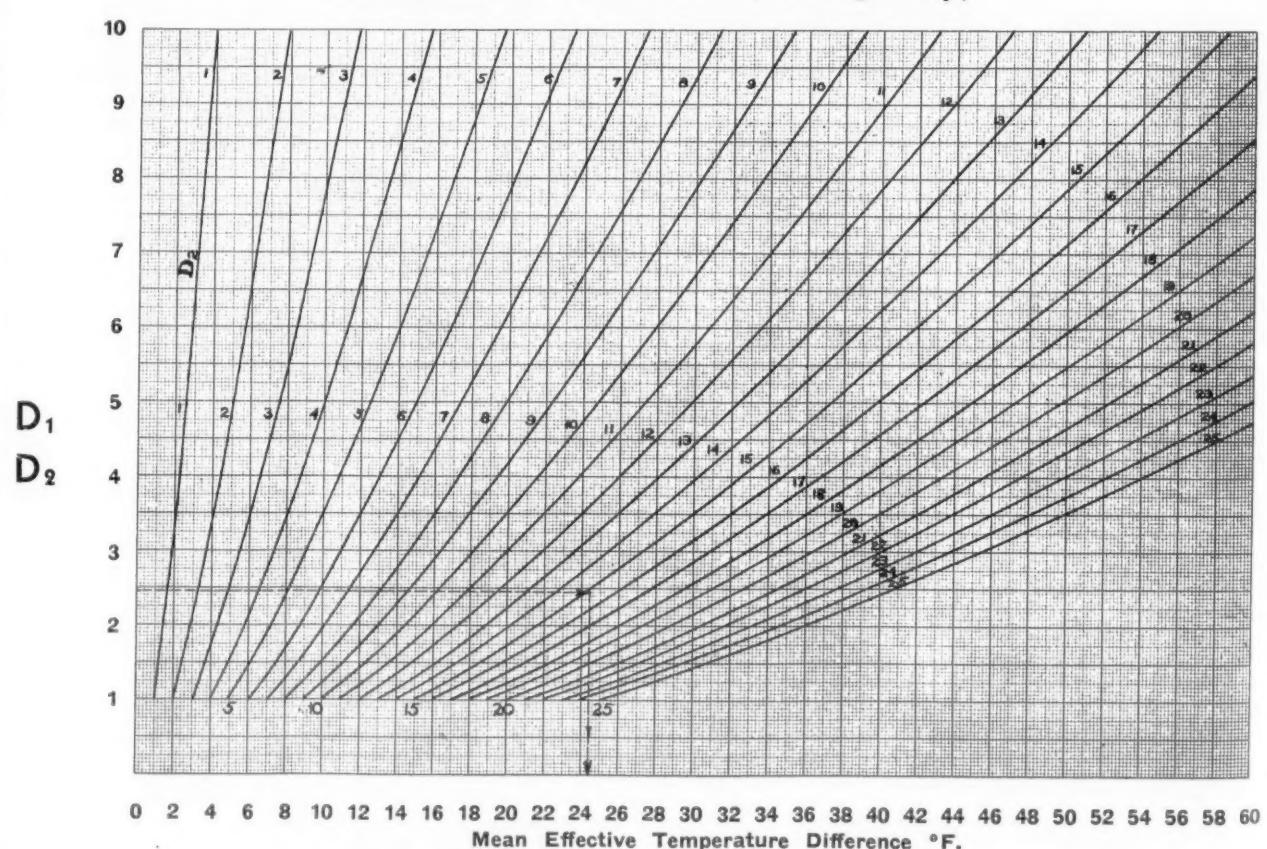


Fig. 85—Directions: Start at left-hand scale with ratio of difference between entering air and leaving air to difference between leaving air and

water to difference between leaving air and entering water. Read MTD directly to difference between leaving air and

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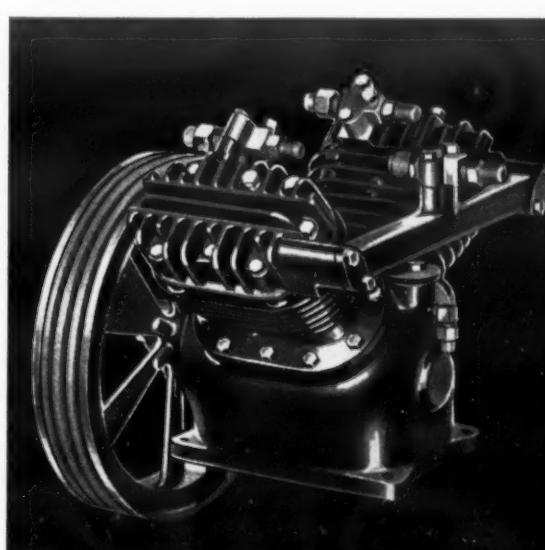
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PAR REFRIGERATION COMPRESSORS

PAR Refrigeration Compressors are made in six sizes. Models R25—R50—R100 are two cylinder pumps and are recommended for use on highsides from 1/4 to 1 horse power. Models R200—R500—R1000 are four cylinder V type construction and are recommended for use on highsides from 1 1/2 to 10 horsepower.

PAR Refrigeration Compressors are designed for use with Freon and will successfully operate with Methyl Chloride. They are designed with large displacements for low speed operation. Multiple cylinder V type construction develops a very smooth and quiet operation.

Pistons are nickel-iron and are fitted with three piston rings. Crank shafts are drop forged steel. Shaft bearings are Oilite. Connecting rods are made of bearing bronze. Wrist pins are steel hardened and ground. Cylinders and cylinder heads are effectively finned for efficient cooling. Shaft seal is hand lapped. External spring used on shaft seal to eliminate chatter and noise.

Equipment includes—grooved fan spoke flywheel, suction and discharge line valves. Bull's-eye sight oil gauge in crank case.

MODERN EQUIPMENT CORPORATION
DEFIANCE • OHIO • U.S.A.

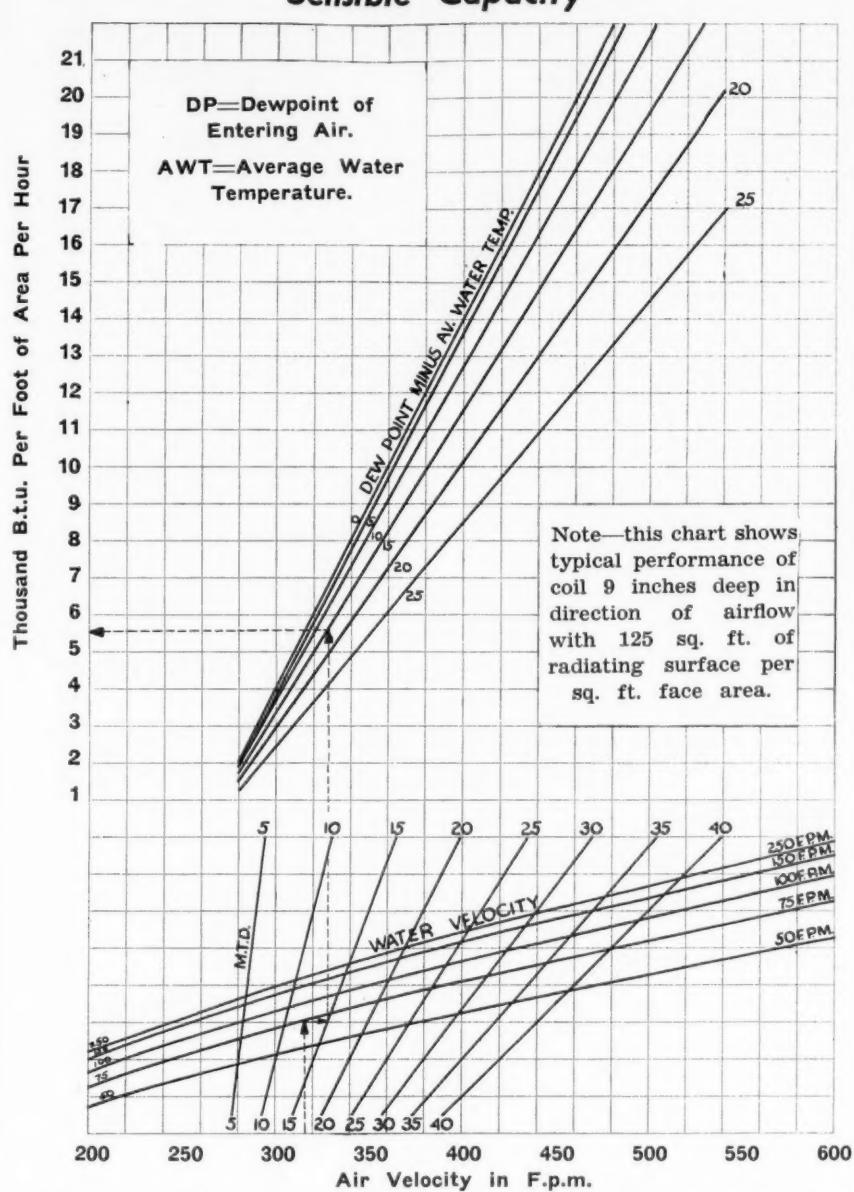
Sensible Capacity

Fig. 86—Directions: Start at lower scale and rise vertically to water temperature difference.

Rise vertically to curve of given differential between dewpoint and average water temperatures.

Move horizontally to curve for given mean effective temperature difference (MTD).

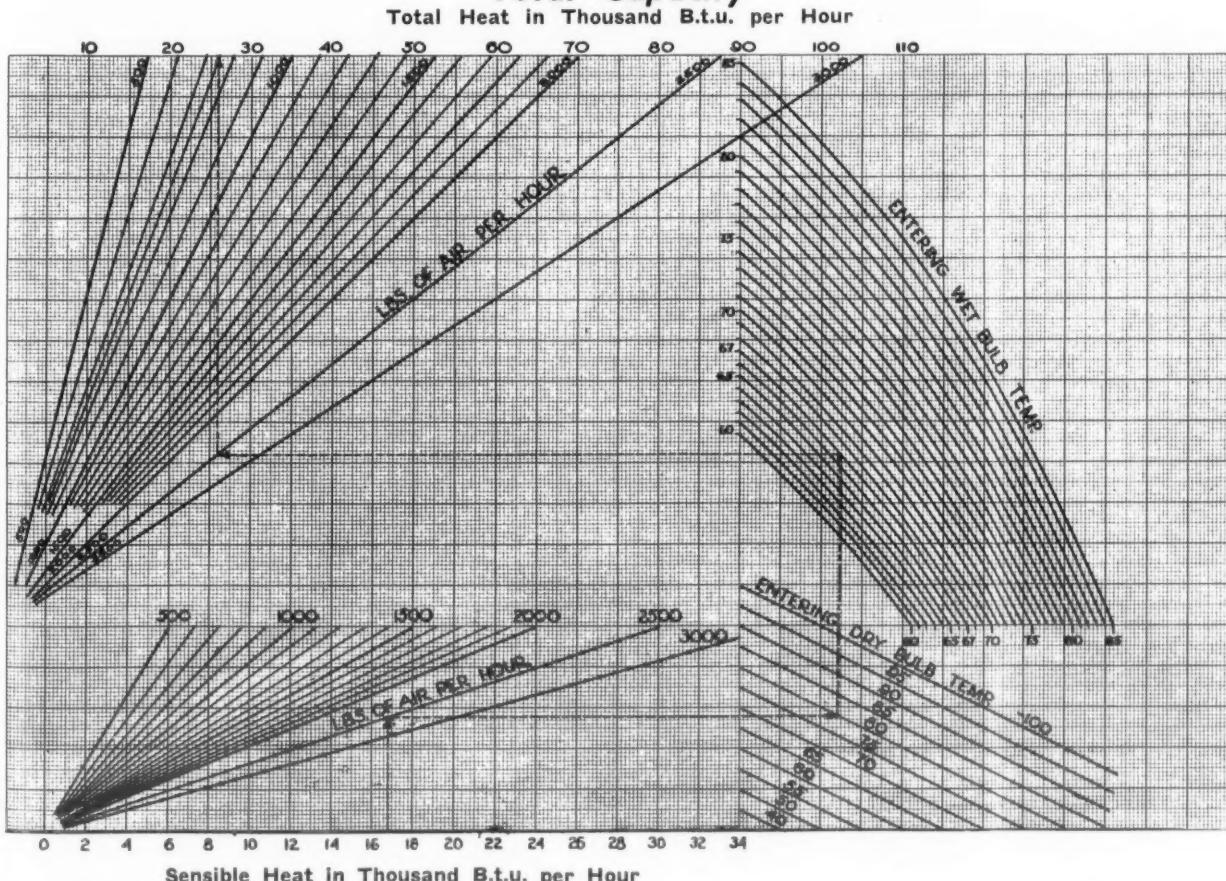
Total Capacity

Fig. 87—This chart shows typical performance of coil from 6 inches to 12 inches deep in direction of airflow.

Directions: Start with sensible work done by coil at lower scale. Rise vertically to curve of given weight of air moved.

Move horizontally right to curve of given entering dry-bulb temperature.

Rise vertically to curve of given

Computing Total Work Done by Coil

(Continued from Page 16, Column 5) assumed, and the process repeated until there is an agreement.

In order actually to obtain a capacity in the field which checks with the computed results, it is then necessary to manifold the coil in such a way that the water velocity equals the velocity values assumed in selecting "K." Obviously the process is quite involved and laborious.

The method of computing the total (sensible plus latent) work done is based upon the assumption that the wet-bulb temperature leaving the coil will be 1° lower than the final dry-bulb temperature. Under usual conditions, the assumption is not far wrong.

The total work done by the coil is determined by noting from Table No. 42, Section No. 21, the total heat per pound of air at the entering air wet-bulb temperature, and from this value subtracting the total heat per pound of air at a wet-bulb temperature 1° lower than the final dry-bulb air temperature, as determined above, in computing the sensible capacity.

This difference, which represents the total work done per pound of air, is then multiplied by the pounds of air circulated per hour through the coil to determine the total work done by the coil. The latent work is computed by deducting the sensible work from the total work.

The charts shown by Figs. 85, 86, 79, and 87 have been prepared to simplify the processes and eliminate the computations described above. If the entering and final water and air temperatures are known, the mean effective temperature difference may be read from Fig. 85.

The procedure involves the use of the "cut and try" method, since tentative final temperatures must be assumed until the final temperatures upon which the MTD is based agree with the capacities read from Fig. 86, as based upon the MTD resulting from use of those final temperatures. The final air temperature resulting from

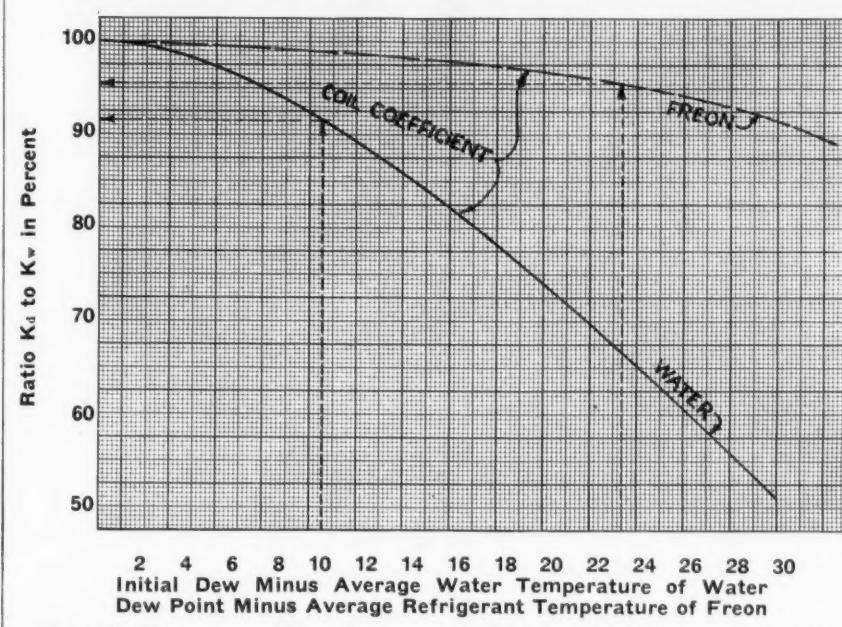
Effect on Sensible 'K' of Latent Work

Fig. 84—This curve shows the percentage relationship of "K" for a given coil at various differentials between dewpoint temperature and average water temperature (with

dewpoint at higher temperature than water) to "K" when no dehumidifying is being done, or when water temperature is higher than dewpoint temperature.

any given sensible capacity in conjunction with any given airflow may be read from Fig. 86.

Having determined the MTD, the sensible capacity of the coil under

any given conditions may be read from Fig. 86, while the total capacity under any condition may be read from Fig. 87, as soon as the sensible

(Continued on Page 18, Column 3)

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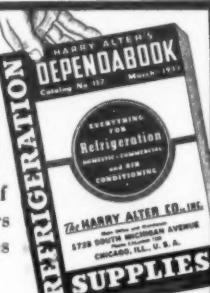
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Cases for displaying food. Everything in
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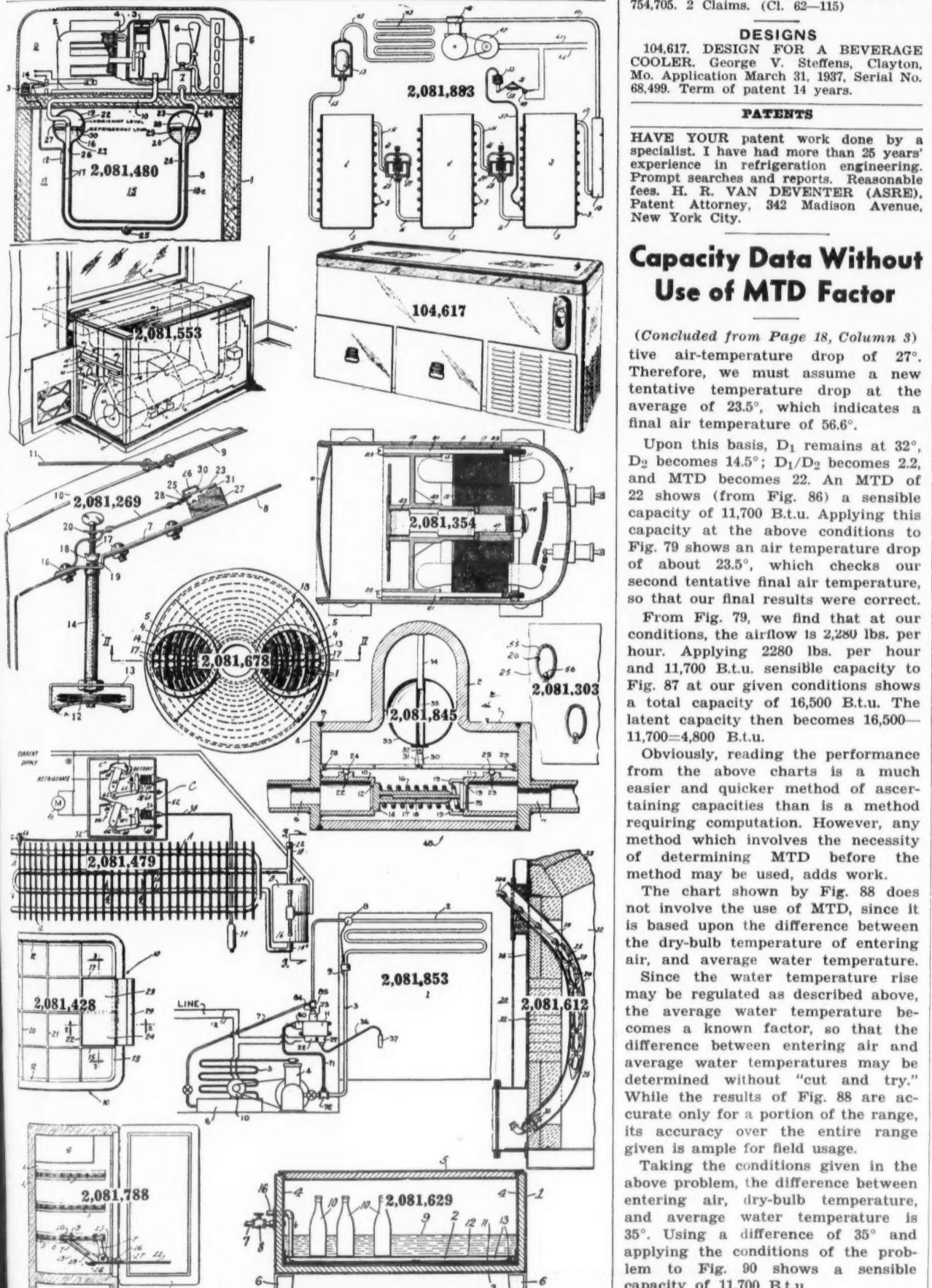
PATENTS

Issued May 25, 1937

2,081,269. SNAP-ACTION THERMO-STATIC SWITCH. John E. Carlson, Forestville, Conn., assignor to The Trumbull Electric Mfg. Co., Plainville, Conn. Application June 16, 1934, Serial No. 730,936. 5 Claims. (Cl. 200-140)

2,081,303. METHOD OF MANUFACTURING HEAT EXCHANGERS. John Karmazin, Huntington, Ind., assignor to Karmazin Engineering Co. Application Dec. 4, 1935, Serial No. 52,818. 4 Claims. (Cl. 113-118)

2,081,354. REFRIGERANT COMPRESSOR. William D. Drysdale, Mount Clemens, Mich., assignor to Walter J. Sudgen, Boston, Mass. Application Nov. 1, 1934, Serial No. 750,982. 4 Claims. (Cl. 230-58)



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PAYMENT in advance is required for advertising in this column.

REPLIES to advertisements with Box No. should be addressed to Air Conditioning and Refrigeration News, 5229 Cass Ave., Detroit, Mich.

POSITIONS AVAILABLE

TERRITORY SALES REPRESENTATIVES—Only men with good records and experience in establishing distributors and organizing territories will be considered. Full particulars regarding education, age, experience, territory previously traveled, and references must accompany first letter. Unusual opportunity for the right men. State salary expected. Confidential. **CURTIS REFRIGERATING MACHINE CO.**, 1988 Kienlen Ave., St. Louis, Mo.

THREE POSITIONS AVAILABLE. Will consider experienced commercial refrigeration salesmen—Duluth, central Wisconsin, Milwaukee—\$200 salary plus bonus. Excellent opportunity for men who can engineer and sell a complete commercial line. Write giving references and complete details as to experience and qualifications to Box 933, Air Conditioning and Refrigeration News.

FACTORY SUPERINTENDENT required by one of the best known manufacturers of commercial and domestic refrigeration equipment in Canada. Applicants must be aggressive and experienced in production planning and plant control. Must be British subject. Replies will be treated in strict confidence. Write, stating age and experience, to Box 946, Air Conditioning and Refrigeration News.

WELL KNOWN MANUFACTURER of commercial refrigeration equipment needs retail salesmen for newly formed Detroit distributorship to sell Felco food and beverage coolers. All virgin territory and a new, non-competitive line. Write, giving details of experience, or call personally. **CLOUD & SON**, 2995 Grand River, Detroit, Michigan.

POSITIONS WANTED

AUTOMATIC CONTROL ENGINEER. Research, development, design, application service, in air conditioning, temperature, space heating, process, refrigeration, heating specialties, etc. Familiar with almost every instrument manufactured. Have fine record, analytically and mechanically minded. Inventor of several highly scientific instruments. Available now. Go anywhere. Write 129 Ormond Avenue, Oaklyn, N. J.

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FOR SALE—Refrigerator service business in fast growing Long Island community. Built up on reputation established 5 years. \$2300 yearly business can be doubled. Fine light basement shop. Supplies and equipment. Low rent. Sacrifice on account illness. \$600 for quick sale. Box 936, Air Conditioning and Refrigeration News.

FOR SALE—Manufacturing rights and complete equipment for manufacturing hermetically sealed household unit including tools, dies, and test equipment. Box 945, Air Conditioning and Refrigeration News.

ILLNESS compels me to sacrifice my business, \$4200 for quick sale. Complete shop and service, employing 5 men at present. Customer list of approximately 2500. Also installing and servicing for 6 companies. Salable equipment, tools, and parts will inventory \$3000. Town of close to 1,000,000 population. Good location and sales front. Hurry. Box 943, Air Conditioning and Refrigeration News.

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EQUIPMENT FOR SALE

ATTENTION service men, dairies, and refrigeration dealers. I have the following equipment for sale. Coils: 59 T.F. at \$15.00; 110 T.F. at \$8.00; 112 T.F. at \$10.00; 117 T.F. at \$12.00. These are just some of the household coils. They are all new Frigidaire. Also a lot of commercial coils. State type you wish and we will try to fill for you and give price if desired. Also have some Model Y compressors completely reoperated like new—\$60.00. Have some Models C.N. and also smaller compressors. Prices on request. Frigidaire, Wagner, and Century 1/4 H.P. 110-220 60 cycle motors fully rebuilt, while they last \$5.00 each. All orders must be accompanied with small deposit. Balance Sight Draft. Goods will be shipped freight charges collect. No charge for crating. **REFRIGERATION SURPLUS JOBBERS**, 5622 Woodland Ave., Cleveland, Ohio.

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CONTROLS REPAIRED for the refrigeration and air-conditioning trade. Any make, almost any type. Every control individually calibrated. Steam traps, packless valve glands, and regulators repaired. If it contains a bellows, Halectric can repair it. Service prompt, prices right, guarantee reliable. **HALECTRIC LABORATORY**, 1793 Lakeview Road, Cleveland, Ohio.

COLD CONTROLS repaired. Ranco Pencil types \$1.75. General Electric, Cutler Hammer, Tag, Penn, and Ranco box types \$2.00. Bishop Babcock, Majestic, Frigidaire, and Penn magnetic switches \$2.50. All work guaranteed 6 months. **UNITED GAUGE AND INSTRUMENT CO.**, 436 W. 57th St., New York City.

MAJESTIC AND GRIGSBY-GRUNOW refrigerator and radio parts service. We are the only original, the only genuine, the only direct factory in the world. All rebuilt units guaranteed 18 months. Beware of inferior replacements and parts. **G & G GENUINE MAJESTIC REFRIGERATOR & RADIO PARTS SERVICE**, 5801 Dickens Ave., Chicago.

HERMETIC UNITS REPAIRED and exchanged—Majestic \$18.50—Westinghouse \$25.00—Gibson \$18.50—General Electric \$25.00—all model household units. Prices F.O.B. our factory—six months guarantee. Complete machine shop service on all makes domestic and commercial. **ALLIED REFRIGERATION PRODUCTS CO.**, 1947 Flushing Ave., Brooklyn, N. Y.

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A. G. E. Sales Total 37,478 to May 29

NEW YORK City—Electric and gas refrigerator sales in the territory of Associated Gas & Electric System to May 29 totaled 37,478 units, 59% of the system's quota for the entire year.

Electric refrigerator sales for this period were 35,653; sales of gas refrigerators totaled 1,825. Sales of 11,445 electric and 682 gas refrigerators have been reported since May 10, opening date of the system's "Refrigeration Jubilee."

Leading salesman in the electric refrigerator division of the jubilee contest for the week ending May 29 was H. W. Crowell of the Cape and Vineyard district with 17 units. Other high salesmen were: H. W. Woolf, Alexandria, Va., 15 units; M. R. Bruen, Brewster, N. Y., 12 units; Joe DuBois, Morehead City, N. C., 11 units.

Copeland Moves New York Office to Long Island

NEW YORK CITY—Copeland Refrigerator Corp. has moved its New York area headquarters from 1700 Broadway to the Brewster building in Long Island City.

The new space, including about 40,000 sq. ft. of floor area, will be used for warehousing and later will include a showroom.

At present the branch handles wholesale business only, distributing household and commercial refrigeration, washing machines, and Zero-zone products.

Subjects for ASHVE Speakers Listed

(Concluded from Page 1, Column 3)
coils, the power cost of air conditioning, and summer cooling in the University of Illinois research residence will be presented.

John Everett, Jr., will discuss "Adaptability of Pre-Cooling Coils to Air Washer Systems"; A. D. Marston will speak on "How Much Power Will an Air-Conditioning System Use?"; Prof. A. P. Kratz, S. Konzo, and E. L. Broderick will report on their "Study of Summer Cooling in the Research Residence, Using Water at Temperatures of 52 and 46° F."

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New G-E Conditioner Is Window-Mounted

(Concluded from Page 1, Column 2)
pumped over the condenser coils at regular intervals, creating evaporation cooling in addition to air cooling.

When the condenser is cooled by evaporation, a small amount of water is continuously pumped over the condenser, and cooling capacity of the unit can be increased to about 11,000 B.t.u. an hour. In this case, a small quarter-inch water line is connected to the unit, but no drain connection is needed.

The unit must be mounted at a window, and has a laminated window duct 18 inches long, which is adjustable to a shorter length if necessary.

Relatively small for its high capacity, the unit is enclosed in a burled walnut cabinet with slotted moldings through which the air return and delivery passes. There are no grilles. All controls are concealed. A jet air delivery provides distribution of conditioned air, and operation of the unit is said to be unusually quiet.

Entire bottom of the unit is covered by a drip pan, and an emergency float stops compressor and water flow when necessary. Forced ventilating of the air in the motor-compressor compartment prevents heat and odors thrown off by the compressor and motor from entering the room.

A capacitor-type compressor motor is used. Operating cost of the unit is claimed to be about 4 cents an hour. The conditioner is 41 inches long, 19 inches wide, and 44 1/2 inches high, and weighs about 550 lbs.



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AIR CONDITIONING AND

JUN 25 1937

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VOL. 21, No. 8,
SERIAL No. 431

5229 CASS AVE., DETROIT, MICH.
JUNE 23, 1937

IN 2 PARTS, PART 2
20 CENTS PER COPY

COMFORT COOLING GUIDE

This section of the NEWS contains a complete directory of manufacturers of summer air-conditioning equipment, parts, materials, and supplies. It is furnished to subscribers at this particular time for two specific reasons:

(1) This is the first really "big year" for the air-conditioning business. All the leading manufacturers report a record volume of orders. No doubt the demand will be intensified when the public experiences uncomfortably hot weather. So, we are giving you the names of all suppliers of comfort-cooling equipment to help you in securing rush deliveries for heat conscious customers.

(2) The Comfort Cooling Guide is also presented to you as a sample section of the 1937 REFRIGERATION AND AIR CONDITIONING DIRECTORY which is now in preparation. The complete DIRECTORY will contain listings of all manufacturers of every type and variety of household, commercial and industrial refrigeration, and air-conditioning equipment, parts, materials, supplies, tools, and accessories. The last edition of the DIRECTORY was issued in 1935 and you will need a copy of this entirely new book as a buying reference. See later issues of the NEWS for further information regarding the 1937 DIRECTORY.

NOTICE: Letters to manufacturers requesting prices and descriptive literature may be mailed in care of the Directory Service Department, Air Conditioning and Refrigeration News, 5229 Cass Ave., Detroit, Mich. Requests for information regarding any of the particular types of equipment listed in this Guide may be addressed to the NEWS in a *single* letter and copies of your inquiry will be forwarded promptly to all suppliers of the products specified.

In compiling the listings in this "Comfort Cooling Guide" every effort has been made to include the names of all manufacturers who are prepared to furnish the products in the various classifications. No charge has been made for these listings and such listings are not a part of any advertising contract. The NEWS assumes no responsibility for any errors or omissions but will welcome corrections to be published in the 1937 DIRECTORY, also suggestions for improving this service to the industry.

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All-Year-Around Air-Conditioning Equipment

Listed under this classification are manufacturers of complete air-conditioning systems which provide the six major year-around air-conditioning functions of cooling and dehumidifying in summer, heating and humidifying in winter, and circulating and cleaning the air in all seasons.

Manufacturers listed in this classification can furnish, according to their literature, complete year-around systems including condensing units for summer cooling. Many manufacturers market one or more major parts of year-around systems which can be adapted to these functions but they do not furnish the complete service. These manufacturers will be classified according to the main functions their products will perform.

Central Air-Conditioning Systems

A central system is one in which the principal component parts are remotely installed and the conditioned air is distributed through ducts to the space to be conditioned.

Air Devices Corp., Chicago, Ill.

Airtemp, Inc., Dayton, Ohio

Baker Ice Machine Co., Omaha, Nebr.

Betz Air Conditioning Corp.
Kansas City, Mo.

Carraway-Byrd Corp., Dallas, Tex.

Carrier Corp., Newark, N. J.

Cooling & Air Conditioning Corp.
Hyde Park, Boston, Mass.

Curtis Refrigerating Machine Co.
St. Louis, Mo.

Delco-Frigidaire Div., General
Motors Sales Corp., Dayton, Ohio

Electrol, Inc., Clifton, N. J.

Fairbanks, Morse & Co., Chicago, Ill.

Frick Co., Waynesboro, Pa.

General Electric Co., Bloomfield, N. J.

General Refrigeration Corp., Beloit, Wis.

Herman Nelson Corp., Moline, Ill.

Ilg Electric Ventilating Co., Chicago, Ill.

Ingersoll-Rand, New York, N. Y.

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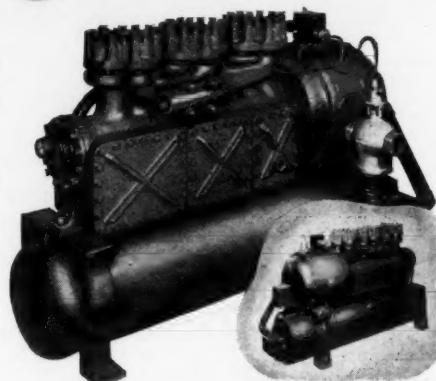


HERMETICALLY-SEALED CONDENSING UNITS

The newest development of Westinghouse Research and Design Engineers is a complete line of *Hermetically-sealed* Condensing Units for air conditioning—from 1 to 23 tons capacity. These new machines are forty per cent smaller in size, as much as fifty per cent lighter in weight. They permit great flexibility in the design of systems, save money in original installation costs and upkeep.

Entire operating mechanism is enclosed in one solid casting, eliminating protruding shafts and troublesome "stuffing boxes." Direct drive of crankshaft by motor located *inside* the housing eliminates the necessity of a heavy supporting chassis, while greatly reducing noise and vibration. The complete mechanism is water-cooled, *including the motor*, permitting installation in unventilated locations.

By removing the side plates of the crankcase casting, the entire operating mechanism is accessible for adjustment

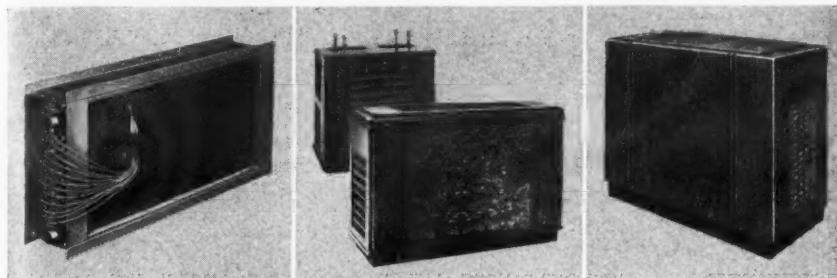


Westinghouse Hermetically-sealed Unit, Type CLS-795
Rated capacity: 266,400 Btu/Hr. Weight: 2,000 lbs.

and service. No refrigerant or water lines need be disconnected.

In all, seventeen important improvements have been introduced in these new Westinghouse Condensing Units for air conditioning.

NEW EVAPORATORS . . . CONDITIONING UNITS . . . MOBILAIRE



WE Evaporators—A new line of extended surface Freon Evaporators exactly matching in capacities the new Westinghouse Hermetically-sealed Condensing Units.

Air Conditioning Units—In wall or ceiling mounted units, or in floor cabinets. Available for summer conditioning, winter conditioning, or complete year around service.

Standard Water-cooled Mobilaire—A self-contained room cooler, the Westinghouse *Mobilaire* provides complete summer air conditioning by cooling, de-humidifying, filtering and gently circulating the air. Easily installed in any room where electrical and water connections are available. It is powered by the famous Westinghouse Hermetically-sealed Mechanism, which is backed by a 5-year warranty.

Central All-Year-Around Systems

(Continued)

Mayflower-Lewis Corp., St. Paul, Minn.
 Modine Mfg. Co., Racine, Wis.
 Nash-Kelvinator Corp., Detroit, Mich.
 Parks-Cramer Co., Fitchburg, Mass.
 Servel, Inc., Evansville, Ind.
 Standard Air Conditioning Corp.
 New York, N. Y.
 United States Air Conditioning Corp.
 Minneapolis, Minn.

Vilter Mfg. Co., Milwaukee, Wis.
 Westinghouse Electric & Mfg. Co.
 Mansfield, Ohio
 Williams Oil-O-Matic Heating Corp.
 Bloomington, Ill.
 Worthington Pump & Machinery Corp.
 Carbondale Division, Harrison, N. J.
 XL Refrigerating Co., Inc., Chicago, Ill.
 York Ice Machinery Corp., York, Pa.

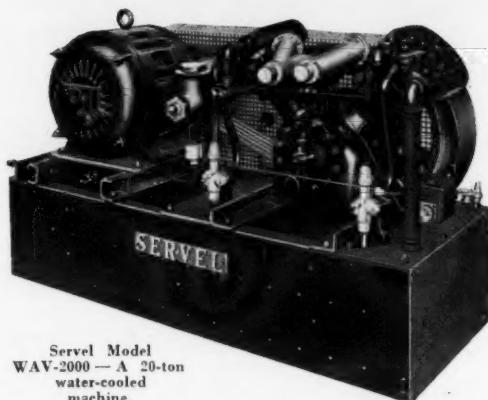
Unitary Air-Conditioning Systems

In the unitary system, two or more component parts (such as a blower, coil, and filter combination) are combined into units and installed in or near the space to be conditioned. The condensing unit may be remotely installed in unitary systems. Localized air distribution represents the basic feature of unitary systems.

Air Devices Corp., Chicago, Ill.
 Airtemp, Inc., Dayton, Ohio
 Baker Ice Machine Co., Omaha, Nebr.
 Betz Air Conditioning Corp.
 Kansas City, Mo.
 Carraway-Byrd Corp., Dallas, Tex.
 Carrier Corp., Newark, N. J.
 Cooling & Air Conditioning Corp.
 Hyde Park, Boston, Mass.
 Corozone Air Conditioning Corp.
 Cleveland, Ohio
 Curtis Refrigerating Machine Co.
 St. Louis, Mo.
 De La Vergne Engine Co.
 Philadelphia, Pa.
 Delco-Frigidaire Div., General
 Motors Sales Corp., Dayton, Ohio
 Electrol, Inc., Clifton, N. J.
 Fairbanks, Morse & Co., Chicago, Ill.
 Frick Co., Waynesboro, Pa.

General Electric Co., Bloomfield, N. J.
 General Refrigeration Corp., Beloit, Wis.
 Herman Nelson Corp., Moline, Ill.
 Ilg Electric Ventilating Co., Chicago, Ill.
 Mayflower-Lewis Corp., St. Paul, Minn.
 Modine Mfg. Co., Racine, Wis.
 Nash-Kelvinator Corp., Detroit, Mich.
 Norge Div., Borg-Warner Corp.
 Detroit, Mich.
 Savage Arms Corp., New York, N. Y.
 Servel, Inc., Evansville, Ind.
 Standard Air Conditioning Corp.
 New York, N. Y.
 Vilter Mfg. Co., Milwaukee, Wis.
 Westinghouse Electric & Mfg. Co.
 Mansfield, Ohio
 Worthington Pump & Machinery Corp.
 Carbondale Division, Harrison, N. J.
 XL Refrigerating Co., Inc., Chicago, Ill.
 York Ice Machinery Corp., York, Pa.

ONLY THE BEST IS GOOD ENOUGH FOR YOUR CUSTOMERS



Servel Model
WAV-2000 — A 20-ton
water-cooled
machine.

AIR CONDITIONING, from the distributor's and contractor's standpoint, demands the utmost in careful engineering and estimating . . . that's why you can not afford to be satisfied with anything less than the best in product performance and factory assistance.

Specify Servel quality . . . if you want maximum dependability . . . the benefit of 15 years' practical experience in the design and application of refrigeration compressors . . . the assurance of

complete satisfaction for you and your customers.

Servel manufactures a full line of electric motor-driven compressor-type refrigerating machines for commercial use and air conditioning duty, together with air-cooled, water-cooled and evaporative condensers for perfectly balanced installations.

Write for details to Servel, Inc., Electric Refrigeration and Air Conditioning Division, Evansville, Indiana.

SERVEL

COMMERCIAL REFRIGERATION and AIR CONDITIONING

Summer Air-Conditioning Equipment

Manufacturers of summer air-conditioning equipment listed in this classification can furnish complete systems which cool, dehumidify, circulate, and filter the air for comfort cooling.

Comfort-cooling equipment is divided into four major groups which are classified by the method of installing the equipment. The groups are central systems, suspended unitary systems, floor-mounted unitary systems, and self-contained room coolers.

Central Air-Conditioning Systems

In a central system, the major component parts are remotely installed and the conditioned air is distributed by ducts to the space to be conditioned.

Air Devices Corp., Chicago, Ill.

Airtemp, Inc., Dayton, Ohio

Baker Ice Machine Co., Omaha, Nebr.

Betz Air Conditioning Corp.
Kansas City, Mo.

Carraway-Byrd Corp., Dallas, Tex.

Carrier Corp., Newark, N. J.

Conditionaire Unit Co., Chicago, Ill.

Cooling & Air Conditioning Corp.
Hyde Park, Boston, Mass.

Curtis Refrigerating Machine Co.
St. Louis, Mo.

Delco-Frigidaire Div., General
Motors Sales Corp., Dayton, Ohio

Electrol, Inc., Clifton, N. J.

Fairbanks, Morse & Co., Chicago, Ill.

Frick Co., Waynesboro, Pa.

General Electric Co., Bloomfield, N. J.

General Refrigeration Corp., Beloit, Wis.

Herman Nelson Corp., Moline, Ill.

Howe Ice Machine Co., Chicago, Ill.

Ilg Electric Ventilating Co., Chicago, Ill.

Ingersoll-Rand, New York, N. Y.

Mayflower-Lewis Corp., St. Paul, Minn.

Modine Mfg. Co., Racine, Wis.

Nash-Kelvinator Corp., Detroit, Mich.

Savage Arms Corp., New York, N. Y.

Servel, Inc., Evansville, Ind.

Standard Air Conditioning Corp.
New York, N. Y.

Trane Co., The, La Crosse, Wis.

United States Air Conditioning Corp.
Minneapolis, Minn.

Vilter Mfg. Co., Milwaukee, Wis.

Westinghouse Electric & Mfg. Co.
Mansfield, Ohio

Williams Oil-O-Matic Heating Corp.
Bloomington, Ill.

Worthington Pump & Machinery Corp.
Carbondale Division, Harrison, N. J.

XL Refrigerating Co., Inc., Chicago, Ill.

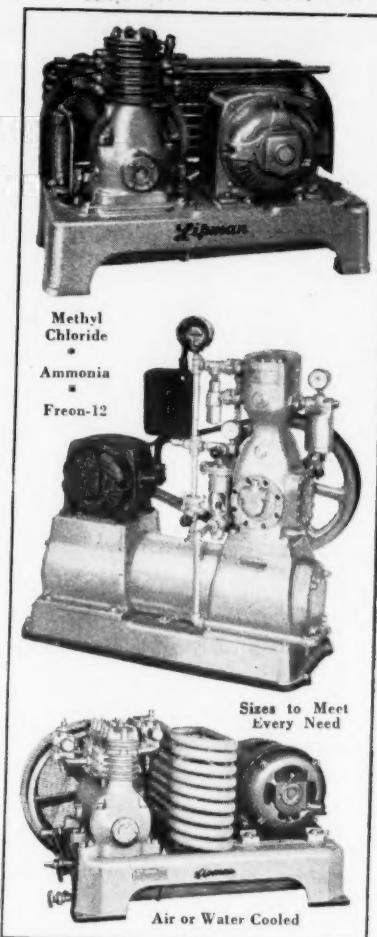
York Ice Machinery Corp., York, Pa.

HANDLE A COMPLETE LINE THAT IS PRACTICAL—DEPENDABLE—PROFITABLE

LIPMAN Automatic Refrigeration and G-R Air Conditioning distributors have several advantages. They have a line which provides a complete range of types and sizes of commercial refrigeration and air conditioning equipment that enables them to bid successfully on all kinds of jobs.



Lipman
AUTOMATIC REFRIGERATION



If you want to handle a line that gives you every modern advantage toward securing large-volume, profitable refrigeration and comfort cooling business write for information covering the LIPMAN G-R distribution plan.

GENERAL REFRIGERATION SALES COMPANY

Dept. O-37, Beloit, Wisconsin, U.S.A.

Suspended Unitary Summer Air-Conditioning Systems

Two or more component parts (such as a blower, filter, coil combination) of the system are suspended from the ceiling or wall in or near the space to be conditioned. Localized air distribution represents the basic feature of unitary systems.

Air Devices Corp., Chicago, Ill.

Airtemp, Inc., Dayton, Ohio

Baker Ice Machine Co., Omaha, Nebr.

Carraway-Byrd Corp., Dallas, Tex.

Carrier Corp., Newark, N. J.

Conditionaire Unit Co., Chicago, Ill.

Cooling & Air Conditioning Corp.
Hyde Park, Boston, Mass.

Corozone Air Conditioning Corp.
Cleveland, Ohio

Curtis Refrigerating Machine Co.
St. Louis, Mo.

Delco-Frigidaire Div., General
Motors Sales Corp., Dayton, Ohio

Fairbanks, Morse & Co., Chicago, Ill.

Frick Co., Waynesboro, Pa.

General Electric Co., Bloomfield, N. J.

General Refrigeration Corp., Beloit, Wis.

Herman Nelson Corp., Moline, Ill.

Howe Ice Machine Co., Chicago, Ill.

Ilg Electric Ventilating Co., Chicago, Ill.

Kauffman Air Conditioning Co., St. Louis

Mayflower-Lewis Corp., St. Paul, Minn.

Modine Mfg. Co., Racine, Wis.

Nash-Kelvinator Corp., Detroit, Mich.

Norge Div., Borg-Warner Corp.
Detroit, Mich.

Servel, Inc., Evansville, Ind.

Standard Air Conditioning Corp.
New York, N. Y.

Vilter Mfg. Co., Milwaukee, Wis.

Westinghouse Electric & Mfg. Co.
Mansfield, Ohio

Worthington Pump & Machinery Corp.
Carbondale Division, Harrison, N. J.

XL Refrigerating Co., Inc., Chicago, Ill.

York Ice Machinery Corp., York, Pa.

CHIEFTAIN

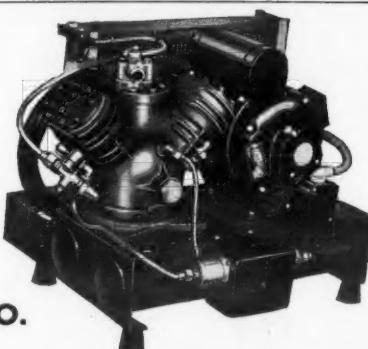
QUALITY-BUILT COMPRESSORS and CONDENSING UNITS

The CHIEFTAIN line represents precision manufacture and proven service, and is designed for all domestic and light commercial applications.

Sizes range $\frac{1}{6}$ to $\frac{3}{4}$ HP.

Write for prices.

TECUMSEH PRODUCTS CO.
TECUMSEH, MICH.



Floor-Mounted Unitary Summer Air-Conditioning Systems

This system is the same as the suspended type except that the cabinet containing the component parts is mounted on the floor in or near the space to be conditioned.

Air Devices Corp., Chicago, Ill.

Airtemp, Inc., Dayton, Ohio

Baker Ice Machine Co., Omaha, Nebr.

Betz Air Conditioning Corp.
Kansas City, Mo.

Carraway-Byrd Corp., Dallas, Tex.

Carrier Corp., Newark, N. J.

Cooling & Air Conditioning Corp.
Hyde Park, Boston, Mass.

Corozone Air Conditioning Corp.
Cleveland, Ohio

Curtis Refrigerating Machine Co.
St. Louis, Mo.

Delco-Frigidaire Div., General
Motors Sales Corp., Dayton, Ohio

Electrol, Inc., Clifton, N. J.

Fairbanks, Morse & Co., Chicago, Ill.

Frick Co., Waynesboro, Pa.

General Electric Co., Bloomfield, N. J.

General Refrigeration Corp., Beloit, Wis.

Herman Nelson Corp., Moline, Ill.

Ilg Electric Ventilating Co., Chicago, Ill.

Kauffman Air Conditioning Co., St. Louis

Mayflower-Lewis Corp., St. Paul, Minn.

Nash-Kelvinator Corp., Detroit, Mich.

Norge Div., Borg-Warner Corp.
Detroit, Mich.

Savage Arms Corp., New York, N. Y.

Servel, Inc., Evansville, Ind.

Standard Air Conditioning Corp.
New York, N. Y.

Vilter Mfg. Co., Milwaukee, Wis.

Westinghouse Electric & Mfg. Co.
Mansfield, Ohio

Worthington Pump & Machinery Corp.
Carbondale Division, Harrison, N. J.

XL Refrigerating Co., Inc., Chicago, Ill.

York Ice Machinery Corp., York, Pa.

Self-Contained Room Coolers

In this type of system, the condensing unit, coils, blower, and filters are all contained in a single cabinet installed in the space to be conditioned.

Air Devices Corp., Chicago, Ill.

Airtemp, Inc., Dayton, Ohio

Carrier Corp., Newark, N. J.

Climax Machinery Co., Indianapolis, Ind.

Corozone Air Conditioning Corp.
Cleveland, Ohio

De La Vergne Engine Co.
Philadelphia, Pa.

Delco-Frigidaire Div., General
Motors Sales Corp., Dayton, Ohio

Electrol, Inc., Clifton, N. J.

Self-Contained Room Coolers

(Continued)

Fairbanks, Morse & Co., Chicago, Ill.

General Electric Co., Bloomfield, N. J.

General Refrigeration Corp., Beloit, Wis.

Herman Nelson Corp., Moline, Ill.

Ilg Electric Ventilating Co., Chicago, Ill.

International Air Conditioning Co., Inc.
New York, N. Y.

Kauffman Air Conditioning Co., St. Louis

Mayflower-Lewis Corp., St. Paul, Minn.

Nash-Kelvinator Corp., Detroit, Mich.

Norge Div., Borg-Warner Corp.
Detroit, Mich.

Pamco Conditionaire Co., Chicago, Ill.

Savage Arms Corp., New York, N. Y.

Westinghouse Electric & Mfg. Co.
Mansfield, Ohio

York Ice Machinery Corp., York, Pa.

Ice Type Room Coolers

Ice Cooling Appliance Corp., Morrison, Ill.

Kool-Kleen Air Conditioning Co.
Newton, Iowa

Willard Metallic Crypt Co., Willard, Ohio

Cold Water-Fan Units

Hexcel Radiator Co., Racine, Wis.

HEXCEL Portable UNIT COOLERS

Bring Extra Profits to You

HERE it is—the new popular priced room cooler. Now your customers who want cool conditioned air this summer in their homes, stores, offices, restaurants, or beauty parlors can have it—and they won't be "stopped" by the cost.

All modern features are incorporated in the construction of Hexcel portable coolers. Cold water is obtained from any convenient point and circulated through a rust-proof, non-corrosive copper coil. A quiet, two-speed fan (no radio interference) produces a constant volume of cooled dehumidified air.

Results are comparable to those produced by the expensive commercial type coolers which have been prohibitive due to their cost.

Simple to connect. Flexible tubing or hose serves for water connection—fan motor connects to any convenience outlet. Finished in Brown Crackle Lacquer with brilliant chromium trim.

Specifications:	Model "A"	Model "AA"
Height	58 $\frac{1}{2}$ "	76"
Width	18 $\frac{3}{4}$ "	24"
Base Dia.	17 $\frac{1}{2}$ "	22 $\frac{1}{2}$ "
Weight	80 lbs.	130 lbs.
Fan	12"	16"
No. Blades	4	4
C.F.M.	335	490
Motor H.P.	1/100	1/40
Motor Speeds	2	2
Current.....	115 Volt A.C.	
List Prices (F.O.B. Racine)....	\$79.95	\$124.50
For D.C. or 25 Cycle, add \$10 to List Price		

It's the Cooler Your Customers Want at the Price They Are Willing to Pay. Get full details—wire or write today.

HEXCEL RADIATOR CO., Racine, Wisconsin

Manufacturers of electric unit heaters, portable humidifiers and heaters, and heat transfer units.



\$79.95

Forced Convection Units and Blower Equipment

Blower-Filter-Coil Units

American Blower Corp., Detroit, Mich.

Buffalo Forge Co., Buffalo, N. Y.

Bush Mfg. Co., Hartford, Conn.

Clarage Fan Co., Kalamazoo, Mich.

Fedders Mfg. Co., Buffalo, N. Y.

King Ventilating Co., Owatonna, Minn.

Manufacturers Fin Coil Co., Chicago, Ill.

Mario Coil Co., St. Louis, Mo.

McQuay, Inc., Minneapolis, Minn.

Peerless of America, Inc., Chicago, Ill.

Refrigeration Appliances, Inc., Chicago

Rempe Co., Chicago, Ill.

Trane Co., The, La Crosse, Wis.

Trenton Auto Radiator Works

Trenton, N. J.

Blower-Coil Units Only

G. & O. Mfg. Co., New Haven, Conn.

Larkin Refrigerating Corp., Atlanta, Ga.

McCord Radiator & Mfg. Co., Detroit

Refrigeration Economics Co., Inc.

Canton, Ohio

Skinner Heating & Ventilating Co., Inc.

St. Louis, Mo.

FIN COILS FOR EVERY PURPOSE

COMMERCIAL COOLING COILS

AIR CONDITIONING COILS BOTH COOLING & HEATING

1907

Bush
Mfg. Co.

1937

IN ALL STANDARD METALS AND FOR ALL REFRIGERANTS

THE BUSH MANUFACTURING CO.

HARTFORD, CONN.

Branch Factory: 610 N. Oakley Blvd., Chicago

NEW YORK

PHILADELPHIA

CINCINNATI

DETROIT



The Heart of Every
VENTILATION
SYSTEM



FANS—“A Complete Line” of AUTOVENT Propeller Fans designed to answer the requirements of every ventilating and refrigerating system. The “31 Series” unit pictured above has a non-overloading power characteristic and is famous for its “limit load” and “non-churning” construction. Available in wheel diameters from 16 inches to 72 inches. Capacities from 500 to 38,000 cfm. Also Pulley Driven and Bucket Wheel units as well as Acid-Moisture proof and Vapor-Explosion proof construction. Write for bulletins Nos. 200, 201, 202.

BLOWERS

“A Complete Line” that embraces every size and style necessary in modern air conditioning systems. The Uniblade Volume Blower (upper right) is designed for economical duct ventilation of small areas. The “V” Belt Driven Blower (lower right) is a compact unit, using a stock motor, that does a big job requiring only minimum floor space. AUTOVENT Blowers are equipped with backwardly or forwardly inclined blades. Performances from 650 to over 100,000 cfm. Wheel diameters from 12½ inches to 75 inches. Write for bulletins Nos. 300, 301, 302.



LOUVRES—Automatic in operation. Rectangular or round construction. A size suitable for complete weather protection of every fan installation. Write for bulletin No. 205.

UNIT HEATERS—Suspended types forced air circulation—many sizes! Available in steam or electric units! Unsurpassed for difficult heating problems! Write for bulletins Nos. 101 and 400.

**AUTOVENT FAN &
BLOWER COMPANY**

1813-23 N. Kostner Ave., Chicago, Ill.

Blower-Filter Units

Air Controls, Inc., Cleveland, Ohio

American Foundry & Furnace Co., Bloomington, Ill.

American Furnace Co., St. Louis, Mo.

Arex Co., Chicago, Ill.

Baker Ice Machine Co., Omaha, Nebr.

Bard Mfg. Co., Bryan, Ohio

Buffalo Forge Co., Buffalo, N. Y.

Campbell Heating Co., Des Moines, Iowa

Campbell Heating Co., E. K. Kansas City, Mo.

Carrier Corp., Newark, N. J.

Cooling & Air Conditioning Corp., Hyde Park, Boston, Mass.

Emerson Electric Mfg. Co., St. Louis, Mo.

Forct-Air Co., Rockford, Ill.

Fox Furnace Co., Elyria, Ohio

Fraser Furnace Co., Stockton, Calif.

Furblo Co., Hermansville, Mich.

Holland Furnace Co., Holland, Mich.

Ilg Electric Ventilating Co., Chicago, Ill.

Kewanee Boiler Corp., Kewanee, Ill.

Lau Blower Co., The, Dayton, Ohio

Mayflower-Lewis Corp., St. Paul, Minn.

National Fan & Blower Co., Chicago, Ill.

Niagara Blower Co., New York; N. Y.

Russell Electric Co., Chicago, Ill.

Schwitzer-Cummins Co., Indianapolis, Ind.

Somers, Inc., H. J., Detroit, Mich.

Spray Wheel Air Conditioners, Inc., Denver, Colo.

Waterman-Waterbury Co., Minneapolis

Westinghouse Electric & Mfg. Co., Mansfield, Ohio

Centrifugal Blowers

Advance Fan & Blower Co., Detroit, Mich.
 Air Controls, Inc., Cleveland, Ohio
 Air Devices Corp., Chicago, Ill.
 American Blower Corp., Detroit, Mich.
 American Foundry & Furnace Co.,
 Bloomington, Ill.
 Arex Co., Chicago, Ill.
 Autovent Fan & Blower Co., Chicago, Ill.
 Bayley Blower Co., Milwaukee, Wis.
 Bishop & Babcock Mfg. Co., Cleveland, O.
 Buffalo Forge Co., Buffalo, N. Y.
 Campbell Heating Co., Des Moines, Iowa
 Campbell Heating Co., E. K.
 Kansas City, Mo.
 Carrier Corp., Newark, N. J.
 Champion Blower & Forge Co.,
 Lancaster, Pa.
 Clarage Fan Co., Kalamazoo, Mich.
 Cooling & Air Conditioning Corp.,
 Hyde Park, Boston, Mass.
 Electrovent Fan & Mfg. Co., Chicago, Ill.
 Emerson Electric Mfg. Co., St. Louis, Mo.
 Furblo Co., Hermansville, Mich.
 Garden City Fan Co., Chicago, Ill.
 General Blower Co., Philadelphia, Pa.
 Ilg Electric Ventilating Co., Chicago, Ill.
 Johnson Fan & Blower Corp., Chicago, Ill.
 King Ventilating Co., Owatonna, Minn.
 Lau Blower Co., The, Dayton, Ohio
 National Fan & Blower Co., Chicago, Ill.
 Niagara Blower Co., New York, N. Y.
 Paramount Engineers & Manufacturers
 Lincoln, Nebr.
 Roberts-Hamilton Co., Minneapolis, Minn.
 Schwitzer-Cummins Co., Indianapolis, Ind.
 United States Air Conditioning Corp.,
 Minneapolis, Minn.
 Waterman-Waterbury Co., Minneapolis

Attic Fans

Air Controls, Inc., Cleveland, Ohio
 Airmaster Corp., Chicago, Ill.
 Arex Co., Chicago, Ill.
 Barrett Engineers, Cleveland Heights, O.
 Buffalo Forge Co., Buffalo, N. Y.
 Campbell Heating Co., Des Moines, Iowa
 Champion Blower & Forge Co.,
 Lancaster, Pa.
 Cooling & Air Conditioning Corp.,
 Hyde Park, Boston, Mass.
 Diehl Mfg. Co., Elizabethport, N. J.
 Electrovent Fan & Mfg. Co., Chicago, Ill.
 Forct-Air Co., Rockford, Ill.
 Garden City Fan Co., Chicago, Ill.
 General Blower Co., Philadelphia, Pa.
 General Electric Co., Bloomfield, N. J.
 General Regulator Corp., Chicago, Ill.
 Ilg Electric Ventilating Co., Chicago, Ill.
 International Engineering Co., Dayton, O.
 Johnson Fan & Blower Corp., Chicago, Ill.
 King Ventilating Co., Owatonna, Minn.
 Lau Blower Co., The, Dayton, Ohio
 National Fan & Blower Co., Chicago, Ill.
 Propellair, Inc., Springfield, Ohio
 Reed Unit-Fans, Inc., New Orleans, La.
 Russell Electric Co., Chicago, Ill.
 Skinner Heating & Ventilating Co., Inc.
 St. Louis, Mo.
 Standard Air Conditioning Corp.,
 New York, N. Y.
 Viking Air Conditioning Corp., Cleveland

Propeller Fans

Advance Fan & Blower Co., Detroit, Mich.
 Air Controls, Inc., Cleveland, Ohio
 Air Devices Corp., Chicago, Ill.
 Airmaster Corp., Chicago, Ill.
 American Blower Corp., Detroit, Mich.
 Arex Co., Chicago, Ill.
 Autovent Fan & Blower Co., Chicago, Ill.
 Barrett Engineers, Cleveland Heights, O.

Propeller Fans (Continued)

Bishop & Babcock Mfg. Co., Cleveland, O.
 Buffalo Forge Co., Buffalo, N. Y.
 Campbell Heating Co., E. K.
 Kansas City, Mo.
 Champion Blower & Forge Co.
 Lancaster, Pa.
 Clarage Fan Co., Kalamazoo, Mich.
 Cooling & Air Conditioning Corp.
 Hyde Park, Boston, Mass.
 Diehl Mfg. Co., Elizabethport, N. J.
 Electrovent Fan & Mfg. Co., Chicago, Ill.
 Emerson Electric Mfg. Co., St. Louis, Mo.
 Forct-Air Co., Rockford, Ill.
 Garden City Fan Co., Chicago, Ill.
 General Blower Co., Philadelphia, Pa.
 General Electric Co., Bloomfield, N. J.
 General Regulator Corp., Chicago, Ill.
 Ilg Electric Ventilating Co., Chicago, Ill.
 Johnson Fan & Blower Corp., Chicago, Ill.
 King Ventilating Co., Owatonna, Minn.
 Manufacturers Fin Coil Co., Chicago, Ill.

National Fan & Blower Co., Chicago, Ill.
 New York Blower Co., Chicago, Ill.
 Peerless Electric Co., Warren, Ohio
 Propellair, Inc., Springfield, Ohio
 Reed Unit-Fans, Inc., New Orleans, La.
 Russell Electric Co., Chicago, Ill.
 Skinner Heating & Ventilating Co., Inc.
 St. Louis, Mo.
 Ward Mfg. Co., Detroit, Mich.

Fan Blades

Air Devices Corp., Chicago, Ill.
 Airmaster Corp., Chicago, Ill.
 Buffalo Forge Co., Buffalo, N. Y.
 Champion Blower & Forge Co.
 Lancaster, Pa.
 Cooling & Air Conditioning Corp.
 Hyde Park, Boston, Mass.
 General Regulator Corp., Chicago, Ill.
 King Ventilating Co., Owatonna, Minn.
 National Fan & Blower Co., Chicago, Ill.
 Skinner Heating & Ventilating Co., Inc.
 St. Louis, Mo.
 Swift Mfg. Co., Detroit, Mich.
 Torrington Mfg. Co., Torrington, Conn.

Blower Wheels

Air Controls, Inc., Cleveland, Ohio
 American Blower Corp., Detroit, Mich.
 Bayley Blower Co., Milwaukee, Wis.
 Bishop & Babcock Mfg. Co., Cleveland, O.
 Buffalo Forge Co., Buffalo, N. Y.
 Clarage Fan Co., Kalamazoo, Mich.
 Cooling & Air Conditioning Corp.
 Hyde Park, Boston, Mass.
 Furble Co., Hermansville, Mich.
 Lau Blower Co., The, Dayton, Ohio
 National Fan & Blower Co., Chicago, Ill.
 New York Blower Co., Chicago, Ill.
 Niagara Blower Co., New York, N. Y.
 Torrington Mfg. Co., Torrington, Conn.
 Trane Co., The, La Crosse, Wis.
 United States Air Conditioning Corp.
 Minneapolis, Minn.

A Fan Blade for Every Purpose

V-Type Cast-Iron Pulleys
Standard or made to specifications

Write for Illustrated Circular

Swift Manufacturing Co.
247 McDougall Detroit, Mich.

PRECISION
PISTONS

A QUARTER CENTURY

has seasoned the quality of Spencer-Smith Pistons. Spencer-Smith's individual Engineering Technique has marked Spencer-Smith as the foremost manufacturer of pistons for compressors. Manufacturers of compressors have recognized the superiority of Spencer-Smith Pistons by their patronage. We solicit your consideration.

"Mark of Quality"
Your insurance against inferior pistons.

SPENCER-SMITH
MACHINE COMPANY
Howell, Michigan

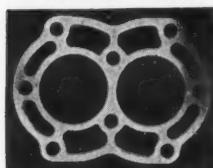
Condensing Units, Condensers & Air Conditioning Coils

Condensing Units

Air Devices Corp., Chicago, Ill.
 Airtemp, Inc., Dayton, Ohio
 Baker Ice Machine Co., Omaha, Nebr.
 Brunner Mfg. Co., Utica, N. Y.
 Carrier Corp., Newark, N. J.
 Climax Machine Co., Clinton, Iowa
 Conditionaire Unit Co., Chicago, Ill.
 Copeland Refrigeration Corp., Detroit
 Curtis Refrigerating Machine Co.
 St. Louis, Mo.
 Deissler Machine Co., Greenville, Pa.
 Fairbanks, Morse & Co., Chicago, Ill.
 Frick Co., Waynesboro, Pa.
 Frigidaire Div., General Motors Corp.
 Dayton, Ohio
 General Electric Co., Cleveland, Ohio
 General Refrigeration Corp., Beloit, Wis.
 Hardy Mfg. Co., Dayton, Ohio
 Howe Ice Machine Co., Chicago, Ill.
 Kellogg Compressor & Mfg. Corp.
 Rochester, N. Y.

Merchant & Evans Co., Philadelphia, Pa.
 Mills Novelty Co., Chicago, Ill.
 Modern Equipment Corp., Defiance, Ohio
 Nash-Kelvinator Corp., Detroit, Mich.
 Nash Refrigeration Co., Inc., Newark, N. J.
 Norge Div., Borg-Warner Corp.
 Detroit, Mich.
 Reliance Refrigerating Machine Co.
 Chicago, Ill.
 Servel, Inc., Evansville, Ind.
 Starr Co., Richmond, Ind.
 Tecumseh Products Co., Tecumseh, Mich.
 Universal Cooler Corp., Detroit, Mich.
 Vilter Mfg. Co., Milwaukee, Wis.
 Waukesha Motor Co., Waukesha, Wis.
 Westinghouse Electric & Mfg. Co.
 Mansfield, Ohio
 Worthington Pump & Machinery Corp.
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 York Ice Machinery Corp., York, Pa.
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An unrivaled Gasket Replacement Service. We have dies for all types of machines. Furnish gaskets exactly according to manufacturers' specifications. Prompt deliveries insured.

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The exact gaskets you need furnished through your Refrigeration Jobber in unique packages. You'll like this service because we supply duplicates of the original gaskets.

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Chicago, Illinois

Quiet . . . Economical **DEPENDABLE**

**47 Condensing Units . . . 5 Compressors in the
BRUNNER LINE of Refrigerating and Air
Conditioning Equipment.**

There's a Brunner for every installation from 100 lbs. to 15 tons of refrigeration. The 47 condensing units and 5 compressors (air and water cooled) range from $\frac{1}{4}$ H.P. to 15 H.P. Models for Methyl Chloride and "Freon 12" as well as Sulphur Dioxide. The vibrationless "balanced design," rugged construction, oversize condensers plus other improvements make Brunner today's outstanding buy. Send for Refrigeration Catalog.

AIR COOLED COMMERCIAL CONDENSING UNITS

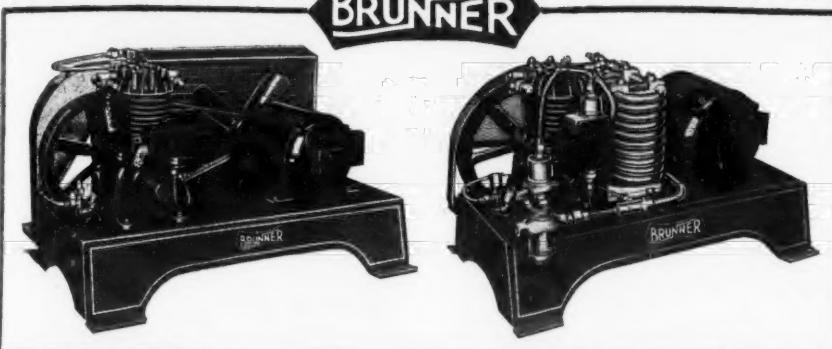
Model No.	A15	A33	A50	A75	A100	A150	A200
Horse Power	$\frac{1}{4}$	$\frac{1}{3}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{2}$	2
No. Cylinders	2	2	2	2	2	2	2
Bore-Stroke	$1\frac{1}{2}$ - $1\frac{3}{8}$	$1\frac{3}{4}$ - $1\frac{1}{8}$	$1\frac{3}{4}$ - $1\frac{1}{8}$	$2\frac{1}{2}$ - $1\frac{3}{8}$	$2\frac{1}{2}$ - $1\frac{3}{8}$	$3\frac{1}{4}$ - $2\frac{1}{4}$	$3\frac{1}{4}$ - $2\frac{1}{4}$
B.T.U. per hr. Capacity Methyl	1905	2520	3690	5520	7030	10700	14550
B.T.U. per hr. Capacity "F-12"	1880	2510	3650	5430	6780	10100	14200

WATER COOLED COMMERCIAL CONDENSING UNITS

Model No.	W50	W75	W100	W150	W200	W300	W500	W750	W1000
Horse P.	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{2}$	2	3	5	$7\frac{1}{2}$	10
No. Cyl.	2	2	2	2	2	4	4	4	4
Bore-Stro.	$1\frac{3}{4}$ - $1\frac{1}{8}$	$2\frac{1}{2}$ - $1\frac{3}{8}$	$2\frac{1}{2}$ - $1\frac{3}{8}$	$3\frac{1}{4}$ - $2\frac{1}{4}$	$3\frac{1}{4}$ - $2\frac{1}{4}$	$3\frac{1}{4}$ - $2\frac{1}{4}$	$3\frac{1}{4}$ - $2\frac{1}{4}$	$4\frac{1}{4}$ -3	$4\frac{1}{4}$ -3
B.t.u. per hr. Capa. Methyl	4810	7760	9600	14900	20200	28200	45100	70200	93000
B.t.u. per hr. Capa. "F-12"	5060	7830	9600	14400	20200	28300	45000	70800	92800

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BRUNNER MANUFACTURING CO.
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 Bush Mfg. Co., Hartford, Conn.
 Conditionaire Unit Co., Chicago, Ill.

Cooling & Air Conditioning Corp.
 Hyde Park, Boston, Mass.

Fedders Mfg. Co., Buffalo, N. Y.
 G. & O. Mfg. Co., New Haven, Conn.

Hardy Mfg. Co., Dayton, Ohio
 Howe Ice Machine Co., Chicago, Ill.
 Kauffman Air Conditioning Co., St. Louis
 Larkin Refrigerating Corp., Atlanta, Ga.
 Long Mfg. Co., Div., Borg-Warner Corp.
 Detroit, Mich.

Manufacturers Fin Coil Co., Chicago, Ill.
 Mario Coil Co., St. Louis, Mo.
 McCord Radiator & Mfg. Co., Detroit
 McQuay, Inc., Minneapolis, Minn.
 Modine Mfg. Co., Racine, Wis.
 Peerless of America, Inc., Chicago, Ill.
 Refrigeration Appliances, Inc., Chicago
 Refrigeration Economics Co., Inc.
 Canton, Ohio
 Rempe Co., Chicago, Ill.
 Rome-Turney Radiator Co., Rome, N. Y.
 Trane Co., The, La Crosse, Wis.
 Trenton Auto Radiator Works
 Trenton, N. J.
 XL Refrigerating Co., Inc., Chicago, Ill.
 Yates-American Machine Co., Beloit, Wis.
 Young Radiator Co., Racine, Wis.

Condensers

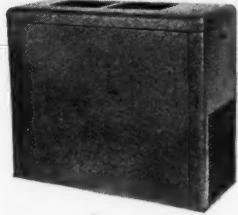
Acme Industries, Inc., Jackson, Mich.
 Aerofin Corp., Newark, N. J.
 Baker Ice Machine Co., Omaha, Nebr.
 Buffalo Forge Co., Buffalo, N. Y.
 Bush Mfg. Co., Hartford, Conn.
 Condenser Service & Engineering Co., Inc.
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 Fedders Mfg. Co., Buffalo, N. Y.
 Filtrine Mfg. Co., Brooklyn, N. Y.
 Foster Wheeler Corp., New York, N. Y.

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 Detroit, Mich.
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 Marlo Coil Co., St. Louis, Mo.
 McCord Radiator & Mfg. Co., Detroit
 Modine Mfg. Co., Racine, Wis.
 Refrigeration Appliances, Inc., Chicago
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 Trenton Auto Radiator Works
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 Delco-Frigidaire Div., General
 Motors Corp., Dayton, Ohio
 Frick Co., Waynesboro, Pa.
 General Refrigeration Corp., Beloit, Wis.
 Marlo Coil Co., St. Louis, Mo.
 McQuay, Inc., Minneapolis, Minn.
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 Peerless of America, Inc., Chicago, Ill.
 Servel, Inc., Evansville, Ind.
 Trane Co., The, La Crosse, Wis.
 Waukesha Motor Co., Waukesha, Wis.
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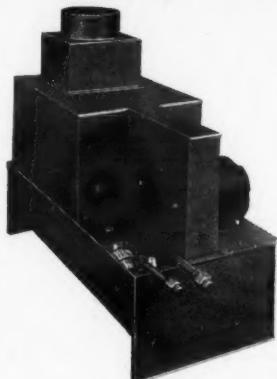
Air-Conditioning Parts and Accessories

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Cooling Tower Co., Inc., New York, N. Y.
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 National Fan & Blower Co., Chicago, Ill.
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 Denver, Colo.
 Trane Co., The, La Crosse, Wis.
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 Vilter Mfg. Co., Milwaukee, Wis.
 XL Refrigerating Co., Inc., Chicago, Ill.
 York Ice Machinery Corp., York, Pa.

The PEERLESS "WATER SAVER"



(EVAPORATIVE CONDENSER)

Cuts Water Costs 85% to 95%

The Peerless "Water Saver" cuts water costs for refrigerant condensing from 85% to 95%, depending on local conditions.

An atomizer disc, rotating in the water reservoir, picks up and diffuses water, throwing it into the air stream set up by the blower. This stream is played over the condensing coils where heat from the refrigerant is transferred to the water on the coil's outer surface. Refrigerant is condensed, water evaporated and carried off in the form of steam. This evaporation represents the **TOTAL WATER COST**. There are no spray nozzles to become clogged—no pumps to cause packing gland trouble.

Peerless "Water Savers" are available for compressors of from 1½ to 25 tons capacity.

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 National Regulator Co., Chicago, Ill.

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"Recalibrator" means lasting accuracy

This patented feature is found in the "Serviceman" described above, and is available in all Marsh refrigeration instruments. It is not subject to the errors of a pointer resetting device. It actually recalibrates the instrument for all points on the dial.

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FOR NEW
REFRIGERATION
CATALOG

No more guess-work when you use the MARSH "Serviceman" REFRIGERATION SERVICE THERMOMETER

It eliminates all the guess-work of a pocket thermometer in service work. Gives you an accurate, easily read, remote reading in the only proper way—with a closed door. Plenty of tubing to reach point of testing, neatly compacted into case. Guaranteed within one de-

gree—has "Recalibrator" to keep it accurate. Use it for servicing all jobs, household and commercial, also in selling refrigerators. Sold in -10° to $+65^{\circ}$ or -10° to $+100^{\circ}$ range at remarkably low dealers net price of (\$Subject to change without notice.) **\$5.00**

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It pays to use refrigeration instruments that are built to "take it" year after year. Marsh gauges, the standard of accuracy, are available in all types for all uses including sulphur dioxide, Freon, carbon dioxide, ammonia and methyl chloride. Marsh recording gauges and recording thermometers are known for rugged construction and lasting accuracy.



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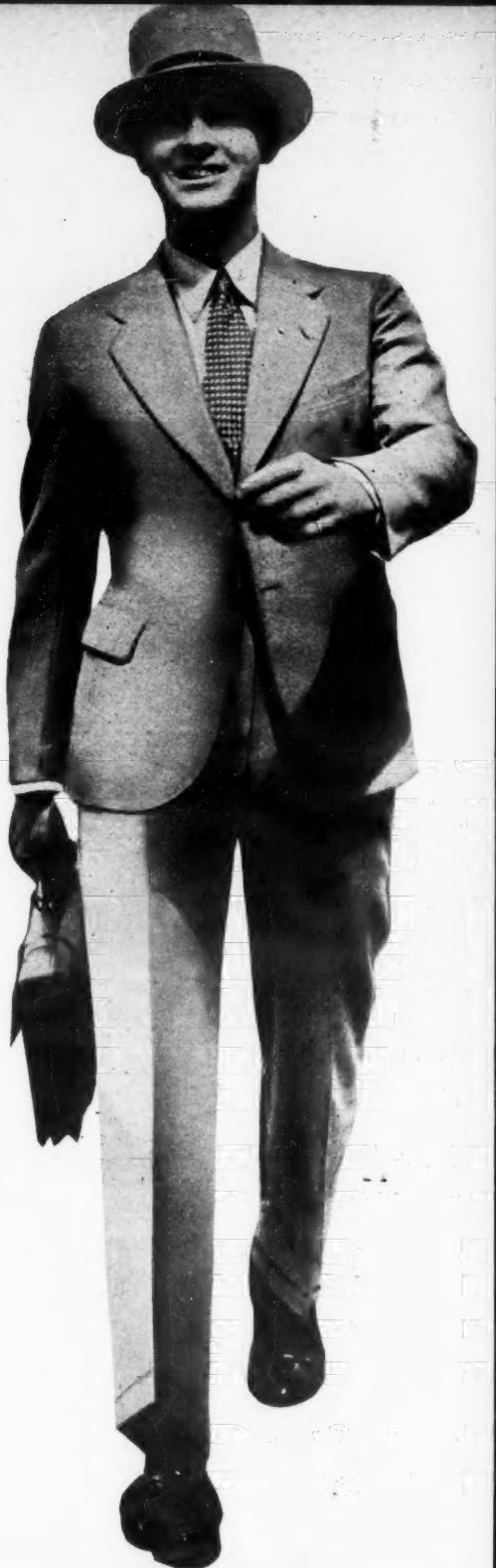
*To the man
on the street*

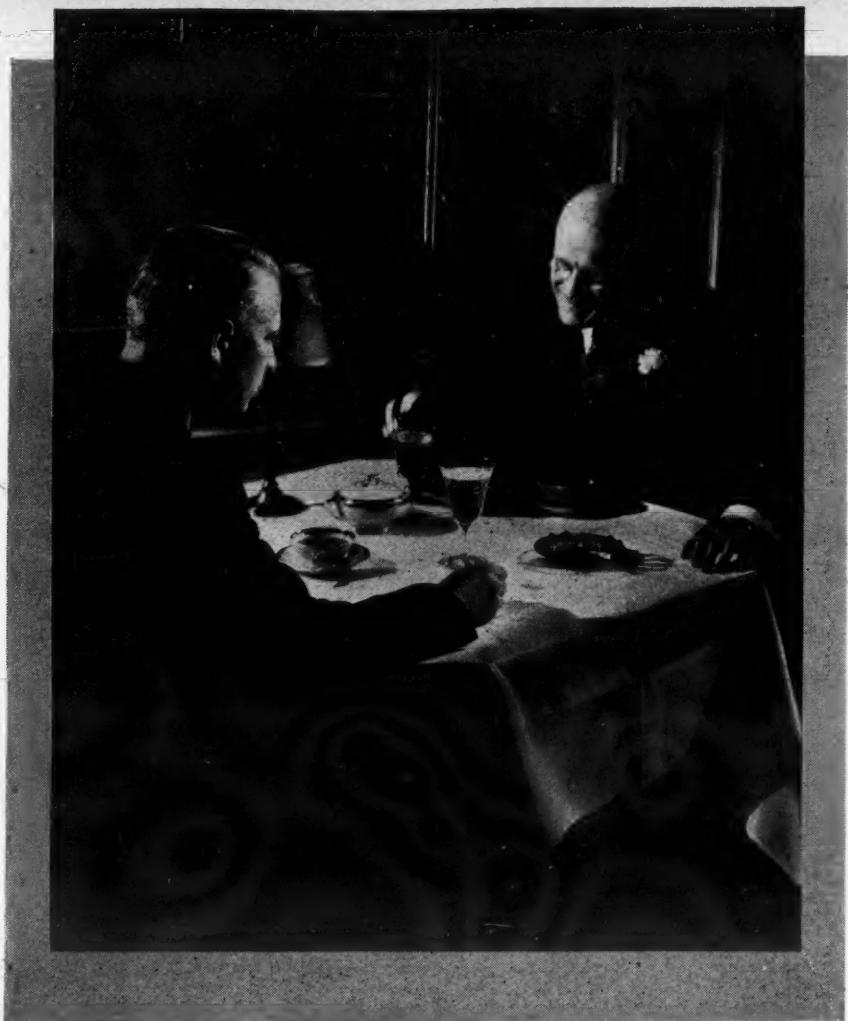
AIR CONDITIONING

means

COMFORT COOLING

TO most folks, "air conditioning" means summer cooling. It means cooling and dehumidifying to result in comfort during warm weather. There is nothing dramatic in heating a building for comfort in cold weather. This has been done since man first learned to build a fire. But to cool a building in hot weather was a new thought that quickly seized public imagination and approval. To the man on the street, "air conditioning" means cooling, and it isn't "air conditioning" if it doesn't include the cooling function.





To the business man

AIR CONDITIONING means COMFORT COOLING

TO OWNERS and managers of office buildings "air conditioning" means cooling. It means the comfort of tenants during hot summer months. It means not only satisfied tenants but it also means a powerful attraction for additional occupancy. To the business man in his office, also, "air conditioning" means summer cooling. It means relief from "heat waves". It means greater efficiency on the part of all employees. For they, too, work in summer comfort.

All in all, to those interested in profits, "air conditioning" means cooling and dehumidifying in summer time. This, to them, is the chief function and the real meaning of "air conditioning."



To the woman in the home

AIR CONDITIONING means COMFORT COOLING

AIR CONDITIONING in the home is gathering momentum upon the central thought of cooling. When the woman in the home thinks of "air conditioning" she thinks of cool, comfortable rooms in summer time. She thinks of the comfort and health of the family.

To her, "air conditioning" means first floor rooms that are delightfully cool and restful during hot summer days and upstairs rooms that are properly cooled to assure peaceful sleep at night. To her, unless it performs the function of cooling and dehumidifying during summer months, it just isn't real "air conditioning."

To the general public

AIR CONDITIONING means COMFORT COOLING

THE public acceptance of "air conditioning" revolves around the cooling and dehumidifying function. The cooling feature which supplies the drama of "air conditioning" was developed and presented to the public, of course, by the refrigeration industry.

It is but natural that the public, in seeking "air-conditioning" equipment, should look first to the distributors and dealers who have successfully established mechanical refrigeration as one of the nation's leading industries. This potent group of business men forms the most logical sales outlet for "air-conditioning" equipment by reason of past experience in dealing with cooling and dehumidifying problems.

Air Conditioning is a rapidly moving, constantly changing industry. The weekly issues of the NEWS are carefully read by the most active factors in the industry. Many readers of the NEWS have already become important outlets for air-conditioning equipment. Many others are excellent "prospects" for the right kind of franchise. To manufacturers of air-conditioning equipment seeking sales outlets, the NEWS offers an exceptional opportunity for establishing contact.

AIR CONDITIONING AND REFRIGERATION NEWS

5229 CASS AVE., DETROIT, MICHIGAN

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 Perfex Controls Co., Milwaukee, Wis.
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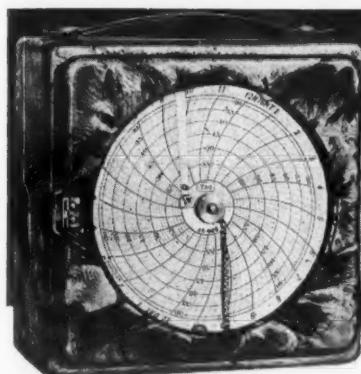
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 In Selling or Servicing

A record of temperature is indispensable in checking the performance of refrigeration and air conditioning equipment. By a permanent written temperature record on a 4½ inch chart, this small but precise Recorder assists in sales and service work. It is easy to carry, only 5¾" square by 4¼" deep and weighs less than 3½ lbs. Write for Catalog No. 1136-25.

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Leeds & Northrup Co., Philadelphia, Pa.

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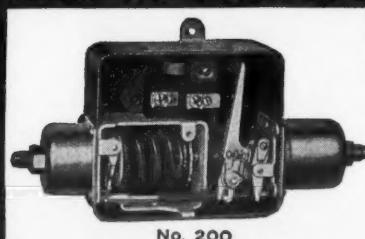
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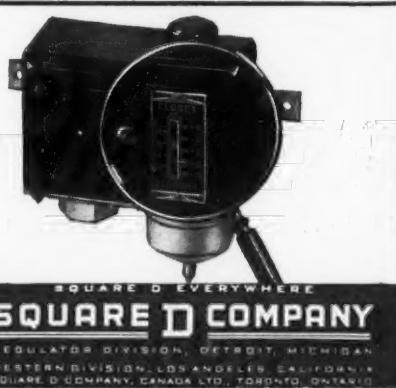
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FIXED DIFFERENTIAL!**
**9100 Regulators
for ICE CREAM CABINET CONTROL**

Visible range scale calibrated from -6° to $+10^{\circ}$ F. for cut-in point... differential fixed at 2° .



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Large and complete stock carried in Chicago and New York. Shipped anywhere same day order is received.



All your installation and servicing requirements from one source. Only quality products . . . for every make refrigerator. Wholesale only. 2% discount on cash or c.o.d. orders.

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THE MASTERCRAFT**ADJUSTABLE PAD AND CARRYING HARNESS****FOR SAFE DELIVERY OF
AUTOMATIC REFRIGERATORS**

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Pad (Adjustable) \$9.50 ea.

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The Pad and Harness are separate.

Individual carrying straps \$1.75 each and up. Write for Folder and Prices on entire Pad Line. Prices subject to change.

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Trane Co., The, La Crosse, Wis.

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Air Conditioning
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- ✓ **QUALITY** We pride ourselves in handling quality merchandise—parts and equipment that stand the acid test of performance.
- ✓ **COMPLETE STOCK** We prepare for future demand and anticipate to the best of our knowledge your requirements. Our stocks are kept up-to-date, permitting prompt shipment.
- ✓ **LOWEST PRICES** Our large volume and efficient method of operation permits us to quote prices that are lowest in the country on refrigeration parts and supplies.

THE HARRY ALTER CO.
1728 So. Michigan Ave. CHICAGO, ILL.
Branches: NEW YORK—CLEVELAND—ST. LOUIS

Filters

Air-Maze Corp., Cleveland, Ohio
 American Air Filter Co., Inc.
 Louisville, Ky.
 American Radiator Co., New York, N. Y.
 Annis, Emmett F., Glendale, Calif.
 Davies Air Filter Co., New York, N. Y.
 Friedrich & Dimmock, New York, N. Y.

Independent Air Filter Co., Chicago, Ill.
 Kleenaire Corp., Stevens Point, Wis.
 National Fan & Blower Co., Chicago, Ill.
 Owens-Illinois Glass Co., Toledo, Ohio
 Plymouth Cordage Co.
 North Plymouth, Mass.
 Somers, Inc., H. J., Detroit, Mich.
 Staynew Filter Corp., Rochester, N. Y.

Grilles, Registers and Shutters

Automatic Shutters

American Foundry & Furnace Co.
 Bloomington, Ill.
 Arex Co., Chicago, Ill.
 Barber-Colman Co., Rockford, Ill.
 Buffalo Forge Co., Buffalo, N. Y.
 Carrier Corp., Newark, N. J.
 Champion Blower & Forge Co.
 Lancaster, Pa.
 Electrovent Fan & Mfg. Co., Chicago, Ill.
 Elgo Shutter & Mfg. Co., Detroit, Mich.
 Emerson Electric Mfg. Co., St. Louis, Mo.
 National Fan & Blower Co., Chicago, Ill.

Waterloo Register Co., Waterloo, Iowa
 Waterman-Waterbury Co., Minneapolis

Louvers

American Foundry & Furnace Co.
 Bloomington, Ill.
 Arex Co., Chicago, Ill.
 Autovent Fan & Blower Co., Chicago, Ill.
 Barber-Colman Co., Rockford, Ill.
 Buffalo Forge Co., Buffalo, N. Y.
 Carrier Corp., Newark, N. J.
 Clarage Fan Co., Kalamazoo, Mich.
 Elgo Shutter & Mfg. Co., Detroit, Mich.
 General Blower Co., Philadelphia, Pa.
 Globe Machine & Stamping Co., Cleveland
 Kleenaire Corp., Stevens Point, Wis.
 National Fan & Blower Co., Chicago, Ill.
 Tuttle & Bailey, Inc., New Britain, Conn.
 Waterloo Register Co., Waterloo, Iowa

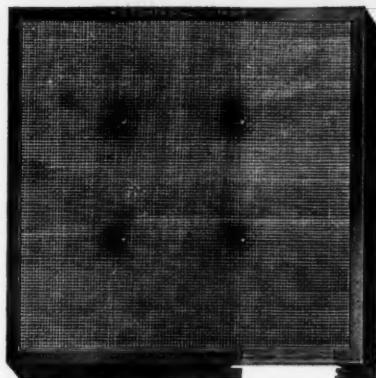
Grilles and Registers

Auer Register Co., Cleveland, Ohio
 Barber-Colman Co., Rockford, Ill.
 Carrier Corp., Newark, N. J.
 Fraser Furnace Co., Stockton, Calif.
 Globe Machine & Stamping Co., Cleveland
 Hart & Cooley Mfg. Co., Chicago, Ill.
 Herman Nelson Corp., Moline, Ill.
 Independent Register Co., Cleveland, Ohio
 Kauffman Air Conditioning Co., St. Louis
 Manhattan Perforated Metal Co., Inc.
 Long Island City, N. Y.
 Tuttle & Bailey, Inc., New Britain, Conn.

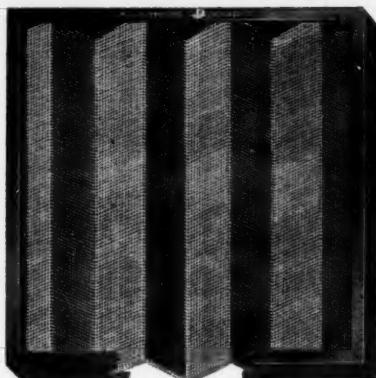
Mushroom Air Diffusers

Anemostat Corp. of America, New York
 Carrier Corp., Newark, N. J.
 Globe Machine & Stamping Co., Cleveland
 Knowles Mushroom Ventilator Co.
 New York, N. Y.
 Tuttle & Bailey, Inc., New Britain, Conn.

Somers Washable "Hair Glass" Filters "The Air-Conditioning Heart"



Somers Flat Type Filter



Somers Vee Type Filter

Somers Hair Glass Filters for air-conditioning installations provide everything required in an efficient air-cleaning system. Consider these features:

Maximum of dust, soot and bacteria separation.
Require no adhesive, coating or impregnation.
Indestructible in normal service.
Minimum Low Pressure Drop.
Odorless and non-absorptive.

FIREPROOF
WASHABLE
Do not rot nor disintegrate
PERMANENT

Somers Hair Glass Filters consist of a hot galvanized frame holding galvanized wire cloth packed with hair-spun glass strands. The glass strands are flexible, do not break up and cannot be drawn into the air stream.

Hair-Glass, being chemically inert, has no facility of absorption; it cannot rust and lasts indefinitely in service. Water either hot or cold may be used to clean it, without impairing its efficiency.

These filters eliminate the necessity, the expense and the inconvenience of periodic replacement.

In every type of air-conditioning installation Somers Hair Glass Filters have proven their efficiency and economy. For industry these filters are unsurpassed in applications involving Sterile Air; Carbon Tetrachloride; Latex; Grinding Dust; Bacteria and Pollen; Ammonia Gas Absorption; Floating Ink; Paint Spray; and Oil.

Made in standard interchangeable sizes to fit filter banks from 16" x 25" to 38" x 42" with choice of No. 1, No. 2 or No. 3 pack. Complete information on request.

H. J. SOMERS, INCORPORATED

Manufacturers of Filters, Hay Fever Machines, Basement & Cabinet Type
Air-Conditioning Equipment

6065 Wabash Ave.

Detroit, Mich.

Insulation

Building

Armstrong Cork Products Co.
Lancaster, Pa.

Cellufoam Corp., Chicago, Ill.

Celotex Corp., Chicago, Ill.

Eagle Picher Sales Co., Cincinnati, Ohio

General Insulating & Mfg. Co.
Alexandria, Ind.

Hinde & Dauch Paper Co., Sandusky, Ohio

Insulite Co., Minneapolis, Minn.

Johns-Manville, New York, N. Y.

Masonite Corp., Chicago, Ill.

Mineral Insulation Co., Chicago, Ill.

Mitchell & Smith, Inc., Detroit, Mich.

Mundet Cork Corp., New York, N. Y.

United Cork Co's., Kearney, N. J.

United States Gypsum Co., Chicago, Ill.

Wood Conversion Co., Chicago, Ill.

Zonolite Corp. of Michigan, Detroit, Mich.

General Insulating & Mfg. Co.
Alexandria, Ind.

Hinde & Dauch Paper Co., Sandusky, Ohio

Johns-Manville, New York, N. Y.

Masonite Corp., Chicago, Ill.

Mitchell & Smith, Inc., Detroit, Mich.

Mundet Cork Corp., New York, N. Y.

Nelson Mfg. Co., B. F., Minneapolis, Minn.

Owens-Illinois Glass Co., Toledo, Ohio

Presstite Engineering Co., St. Louis, Mo.

United Cork Co's., Kearney, N. J.

Wood Conversion Co., Chicago, Ill.

Zonolite Corp. of Michigan, Detroit, Mich.

Duct

American Hair & Felt Co., Chicago, Ill.

Armstrong Cork Products Co.
Lancaster, Pa.

Burgess Battery Co., Chicago, Ill.

Cellufoam Corp., Chicago, Ill.

Celotex Corp., Chicago, Ill.

Cork Import Corp., New York, N. Y.

Cork Insulation Co., Inc., New York, N. Y.

Dry-Zero Corp., Chicago, Ill.

Sound Deadening

Armstrong Cork Products Co.
Lancaster, Pa.

Burgess Battery Co., Chicago, Ill.

Cellufoam Corp., Chicago, Ill.

Celotex Corp., Chicago, Ill.

Cork Insulation Co., Inc., New York, N. Y.

Eagle Picher Sales Co., Cincinnati, Ohio

General Insulating & Mfg. Co.
Alexandria, Ind.

Johns-Manville, New York, N. Y.

Mineral Insulation Co., Chicago, Ill.

Mitchell & Smith, Inc., Detroit, Mich.

Nelson Mfg. Co., B. F., Minneapolis, Minn.

Presstite Engineering Co., St. Louis, Mo.

Wicander & Co., Inc., New York, N. Y.

Zonolite Corp. of Michigan, Detroit, Mich.

COVER YOUR AIR-CONDITIONING DUCTS WITH

CELOTEX

REG. U. S. PAT. OFF.

**THE RIGID, CANE FIBRE INSULATION
THAT'S QUICKLY INSTALLED AND MAINTAINS
DESIRED TEMPERATURES ECONOMICALLY**

● Celotex Insulating Cane Fibre Board is the ideal covering for air ducts—it is quickly installed, and permits the maintenance of desired temperatures at *lower operating cost*.

This widely used insulating board has a thermal conductivity of only 0.3 Btu. per inch thickness. It comes in big, light, rigid boards that cover large areas of ducts *in one application*. It cuts easily with ordinary tools, goes up fast—and once in place stays put.

For insulating cold air ducts, specify Celotex VLTI—the vapor-proofed low temperature insulating blocks that are *completely sealed* against vapor penetration at the factory by a special wrapping and coating.

Celotex Insulating Cane Fibre Board and Celotex VLTI are protected against termites, dry rot, and fungus growth by the *exclusive Ferox Process* (patented).

For expert advice on solving any insulating problems in connection with air conditioning, write our engineers. No obligation.

THE CELOTEX CORPORATION, 919 N. MICHIGAN AVE., CHICAGO, ILL.

CELOTEX
BRAND — INSULATING CANE BOARD
Reg. U. S. Pat. Off.

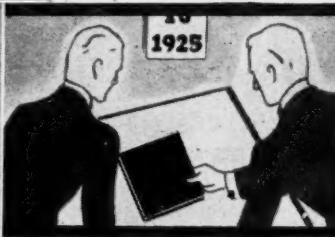
World's Largest Manufacturer of Structural Insulation

For Difficult Application —NELCO Silencing Felt

- A new flexible silencing felt which is quickly and easily applied to metal surfaces is now available to manufacturers in the refrigeration, air conditioning, and sheet metal industries.
- Because of its pliability and freedom from breakage under conditions of severe vibration, Nelco Silencing Felt is adapted to use in places where stiff or breakable acoustic material could not be used.
- Nelco Silencing Felt is furnished in rolls or can be die cut to fit any dimension.
- In spite of its low cost, Nelco Silencing Felt is highly efficient in sound silencing when applied to metal surfaces, is vermin-proof, and is fire resistant. Due to its ease of application, manufacturers have been able to effect substantial savings.
- Nelco Silencing Felt is being used to silence sound in refrigerator cabinets, air conditioning cabinets, air conditioning ducts, blower fan pent houses, etc.
- If your manufacturing process requires sound silencing, write us for samples or send blue prints of your units so that we may quote on your requirements.

The B. F. NELSON MFG. CO.
Corner Main and Marshall Streets, N. E.
MINNEAPOLIS • MINNESOTA

**FIRST
IN 1925**



**FIRST
IN 1937**



FIRST—Wood Conversion Company was the first manufacturer to develop a low density package insulation for refrigerators. The Balsam-Wool Sealed Slab package was introduced as early as 1925.

FIRST—Wood Conversion Company was the first to bring out a special packaging machine which completely fabricates the sealed slab in the plant of the refrigerator manufacturer . . . the first to offer the refrigerator manufacturer a substantial saving in overhead by the use of licensed machines in his own plant.

FIRST—Wood Conversion Company was the first to offer—in Balsam-Wool Fibre Slabs—an insulation that has *everything*—high efficiency—protection from moisture—non-settling, clean and economical.

FIRST—Proved in hundreds of thousands of refrigerators, Balsam-Wool Fibre Slabs stand first in preference among refrigerator manufacturers. The volume of Balsam-Wool Fibre Slabs used for domestic refrigerators is today greater than that of any other insulation.

WOOD CONVERSION COMPANY
Room 164, First National Bank Bldg.
ST. PAUL, MINNESOTA

New York, N. Y.

Chicago, Ill.

BALSAM-WOOL
FIBRE SLABS
PRODUCT OF WEYERHAEUSER
WEYERHAEUSER FOREST PRODUCTS

Ionizing and Ozone Devices

Ionizers

Corozone Air Conditioning Corp.
Cleveland, Ohio

Montgomery Bros., San Francisco, Calif.
Triox Engineering Co., St. Louis, Mo.

Ozonators

Electroaire Corp., Chicago, Ill.
Montgomery Bros., San Francisco, Calif.
Triox Engineering Co., St. Louis, Mo.

Odor Absorbers

Consolidated Air Conditioning Corp.
New York, N. Y.

EMPLOYERS CALL ON Utilities Engineering Institute When FULLY TRAINED REFRIGERATION and AIR CONDITIONING MEN ARE NEEDED

Men accepted for training by this organization become thoroughly trained in all phases of air conditioning and refrigeration. They know how to render service that keeps customers satisfied and builds good will.

Home Study & Shop Practice
Our men are completely schooled in theory and practice, becoming expert in trouble shooting, servicing and installation of all types of refrigerating and air conditioning equipment.

That is why Manufacturers, Distributors, Dealers and Service organizations call on us when in need of skilled and thoroughly dependable men.

At Your Service

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(Founded 1927)
400-410 N. Wells St., Chicago, Ill.

Motors and Motor Equipment

Electric Motors

Century Electric Co., St. Louis, Mo.

Delco Products Div., General
Motors Corp., Dayton, Ohio

Diehl Mfg. Co., Elizabethport, N. J.

Electric Machinery Mfg. Co.
Minneapolis, Minn.

Emerson Electric Mfg. Co., St. Louis, Mo.

General Electric Co., Schenectady, N. Y.

Holtzer-Cabot Electric Co., Boston, Mass.

Leland Electric Co., Dayton, Ohio

Lincoln Electric Co., Cleveland, Ohio

Master Electric Co., Dayton, Ohio

Peerless Electric Co., Warren, Ohio

Sterling Electric Motors, Inc.
Los Angeles, Calif.

Wagner Electric Corp., St. Louis, Mo.

Westinghouse Electric & Mfg. Co.
Mansfield, Ohio

Gas Engines

Cooper Bessemer Corp., Mt. Vernon, Ohio

Fairbanks, Morse & Co., Chicago, Ill.

Waukesha Motor Co., Waukesha, Wis.

Wells Mfg. Co., Fond du Lac, Wis.

Circuit Breakers

Cutler-Hammer, Inc., Milwaukee, Wis.

General Electric Co., Schenectady, N. Y.

Heinemann Electric Co., Trenton, N. J.

Westinghouse Electric & Mfg. Co.
Mansfield, Ohio

Low Voltage Transformers

Automatic Products Co., Milwaukee, Wis.
 Cutler-Hammer, Inc., Milwaukee, Wis.
 Detroit Lubricator Co., Detroit, Mich.
 Friez & Sons, Inc., J. P., Baltimore, Md.
 Fulton Sylphon Co., Knoxville, Tenn.
 General Electric Co., Schenectady, N. Y.
 Minneapolis-Honeywell Regulator Co.
 Minneapolis, Minn.
 Perfex Controls Co., Milwaukee, Wis.
 Russell Electric Co., Chicago, Ill.
 Sorgel Electric Co., Milwaukee, Wis.
 Wagner Electric Co., St. Louis, Mo.
 Westinghouse Electric & Mfg. Co.
 Mansfield, Ohio

Overload Relays

Allen-Bradley Co., Milwaukee, Wis.
 Cutler-Hammer, Inc., Milwaukee, Wis.
 Detroit Lubricator Co., Detroit, Mich.
 General Electric Co., Schenectady, N. Y.
 Heinemann Electric Co., Trenton, N. J.
 Square D Co., Industrial Controller Div.
 Milwaukee, Wis.
 Westinghouse Electric & Mfg. Co.
 Mansfield, Ohio

Relays

Allen-Bradley Co., Milwaukee, Wis.
 Automatic Products Co., Milwaukee, Wis.
 Clark Controller Co., Cleveland, Ohio
 Cutler-Hammer, Inc., Milwaukee, Wis.
 Detroit Lubricator Co., Detroit, Mich.
 Friez & Sons, Inc., J. P., Baltimore, Md.

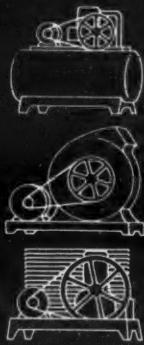


Dayton V-Belts are the logical choice for all types of appliances, because they provide silent, dependable transmission—because their powerful grip prevents slippage—because they run smoothly without weaving, twisting or vibrating. A nearby distributor carries a complete stock.

THE DAYTON RUBBER MANUFACTURING CO.
 DAYTON, OHIO
 WORLD'S LARGEST MANUFACTURER OF V-BELTS

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Dayton
 V-BELTS



Relays (Continued)

General Controls Co., San Francisco, Calif.
General Electric Co., Schenectady, N. Y.
Mercoid Corp., Chicago, Ill.
Penn Electric Switch Co.
Des Moines, Iowa
Perfex Controls Co., Milwaukee, Wis.
Square D Co., Industrial Controller Div.
Milwaukee, Wis.
Struthers Dunn, Inc., Philadelphia, Pa.
Westinghouse Electric & Mfg. Co.
Mansfield, Ohio

Starters

Allen-Bradley Co., Milwaukee, Wis.
Clark Controller Co., Cleveland, Ohio
Cutler-Hammer, Inc., Milwaukee, Wis.
General Electric Co., Schenectady, N. Y.
Heinemann Electric Co., Trenton, N. J.
Square D Co., Industrial Controller Div.
Milwaukee, Wis.
Westinghouse Electric & Mfg. Co.
Mansfield, Ohio

V-Belts

Allis-Chalmers, Texrope Div., Milwaukee
Dayton Rubber Mfg. Co., Dayton, Ohio
Gates Rubber Co., Denver, Colo.

Gilmer Co., L. H., Philadelphia, Pa.
Goodyear Rubber Co., Akron, Ohio
Manhattan Rubber Mfg. Div. of
Raybestos-Manhattan, Inc., Passaic, N. J.

V-Belt Drives

Allis-Chalmers, Texrope Div., Milwaukee
Dayton Rubber Mfg. Co., Dayton, Ohio
Gates Rubber Co., Denver, Colo.
Rockwood Mfg. Co., Indianapolis, Ind.
Wood's Sons Co., T. B.
Chambersburg, Pa.
Worthington Pump & Machinery Corp.
Harrison, N. J.

Pumps

American Steam Pump Co.
Battle Creek, Mich.
Buffalo Pumps, Inc., N. Tonawanda, N. Y.
Chicago Pump Co., Chicago, Ill.
Crane Co., Chicago, Ill.
Davidson Co., M. T., New York, N. Y.
Deming Co., Salem, Ohio
Hoffman Specialty Co., Waterbury, Conn.
Layne & Bowler, Inc., Memphis, Tenn.
Pomona Pump Co., Pomona, Calif.
Schleyer Pump Co., E. C., Anderson, Ind.
Sterling Pump Corp., South Bend, Ind.
Worthington Pump & Machinery Corp.
Harrison, N. J.

MANHATTAN

V BELTS

THE MANHATTAN RUBBER MFG. DIV.

LONGER LIFE

Better performance . . . because internal heat is minimized by Manhattan's exclusive construction: the endless Whipcord is completely floated in rubber, welded into a strong tension member which is placed in the neutral axis area. Above the tension area is an extensible section; below a compression section . . . Repeated tests prove Manhattan V-Belts run smoothly . . . noiselessly . . . enduringly.

Of Raybestos-Manhattan, Inc.
45 Townsend St. Passaic, N. J.

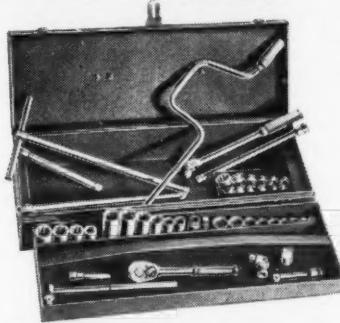
EVERY TOOL YOU NEED

FOR PRODUCTION...
MAINTENANCE...
OR SERVICING



R200B SET

One piece forged ratchet with $\frac{1}{4}$ " square opening for work on valve stems. $1\frac{1}{2}$ " extension, 2 adaptor plugs, 1 Kerotest valve packing nut socket, 5 square valve stem sockets, 5 packing gland nut sockets and 3 double-broached Ferret sockets. Complete in metal box.



NO. 82 FERRET SET Get around corners, squeeze into closest places, and get those hard-to-reach nuts and bolts. Set contains 36 units, including 7 Standard Double Hex Ferret Sockets $\frac{3}{16}$ " to $\frac{1}{2}$ "; 6 Extra Deep Double Hex Sockets $\frac{7}{16}$ " to $\frac{3}{4}$ "; 6 Double Hex Flexockets $\frac{3}{8}$ " to $1\frac{1}{16}$ "; 4 Deep Square Sockets $\frac{7}{16}$ " to $\frac{5}{8}$ "; a Ratchet, and handle equipment illustrated.



WRITE FOR CATALOG

For any type of equipment, Snap-on can supply you special tools like these illustrated—standard wrenches in complete Socket, Boxocket, and Open End types—small hand tools like screw drivers, chisels, pliers, hammers, etc., and sturdy metal boxes in many sizes.



B 3805 Drive Pulley Puller

Pulls fly-wheels on air conditioning and commercial refrigeration units. As gripping surface for puller arms, tool includes 2 horse shoe washers ($2\frac{1}{2}$ " and $3\frac{1}{8}$ " inside diam.).



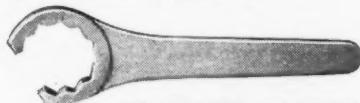
Tube Bender Bends tubes by hand to any desired shape with no danger of puncturing tube or causing it to collapse. Sizes $\frac{1}{4}$ ", $5/16$ ", $\frac{3}{8}$ ", $7/16$ ", $\frac{1}{2}$ ", $\frac{5}{8}$ " and $\frac{3}{4}$ ".



Tube Cutter Cuts copper, brass, bronze or similar tubing from $\frac{1}{8}$ " to 1" diameter. Thin edged steel cutter wheel cuts clean through entire thickness—wheel easily replaced. "V" blade reams out burrs on inside of tube after cutting.



Special Refrigeration Wrench For valve stems, couplings, etc. Ratcheting ends and handy reversing trigger. Square openings $3/16$ ", $\frac{1}{4}$ ", $\frac{5}{16}$ ". Hex. opening $\frac{1}{2}$ ".



FLARE-NUT WRENCH Cut-away head allows space to pass wrench over tube or shaft. Double broaching gives turning room in close quarters. Sizes $\frac{3}{4}$ ", $\frac{7}{8}$ ", 1", $1\frac{1}{8}$ " and larger.

Snap-on Tools are available only through

Snap-on Tools, Inc.

Kenosha, Wisconsin

Branch Warehouses located in 37 Principal Cities

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Freon

Kinetic Chemicals, Inc., Wilmington, Dela.

Methyl Chloride

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R & H Chemicals Dept.
E. I. du Pont de Nemours & Co., Inc.
Wilmington, Dela.

Virginia Smelting Co., West Norfolk, Va.

Sulphur Dioxide

Ansul Chemical Co., Marinette, Wis.

Calco Chemical Co., Bound Brook, N. J.
Virginia Smelting Co., West Norfolk, Va.

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American Radiator Co., New York, N. Y.

Chase Brass & Copper Co., Inc.
Waterbury, Conn.

Linderme Tube Co., Cleveland, Ohio

Mueller Brass Co., Port Huron, Mich.

National Copper & Smelting Co.
Cleveland, Ohio

Penn Brass & Copper Co., Erie, Pa.

Revere Brass Co., Inc., New York, N. Y.

Scovill Mfg. Co., Waterbury, Conn.

United Wire & Supply Co.
Providence, R. I.

Wolverine Tube Co., Detroit, Mich.

STILL THE TOPS



in

**TROUBLE-FREE
REFRIGERANTS**

ANSUL

SULPHUR DIOXIDE
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ANSUL CHEMICAL COMPANY
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A NEW STANDARD IN INDUSTRIAL TRAINING

Visitors from the industry—executives and engineers—have said of the Refrigeration & Air Conditioning Institute, "You have set a new standard in industrial training . . . Nowhere else have we seen such care in selecting men for training . . . such thoroughness in preparing them . . . such completely equipped laboratory and shops for them to work in."

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Employers and men interested in obtaining such "officially" recognized training are invited to write for details.

REFRIGERATION AND AIR CONDITIONING INSTITUTE

2130-2158 Lawrence Ave., Chicago, Ill.

Brass Pipe

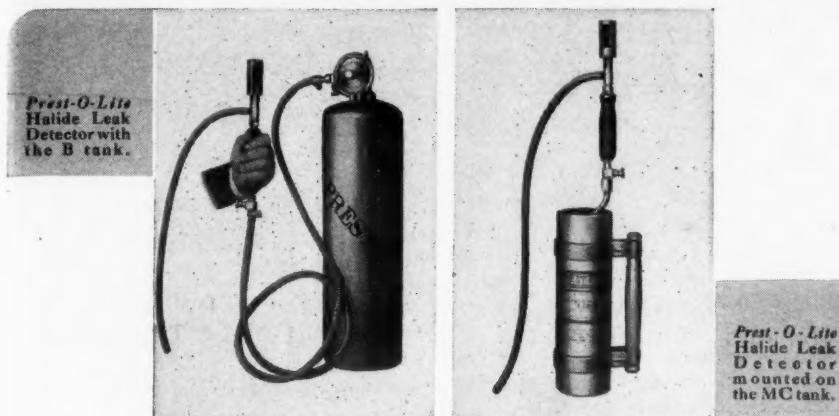
American Brass Co., Waterbury, Conn.
 Bridgeport Brass Co., Bridgeport, Conn.
 Mueller Brass Co., Port Huron, Mich.

Penn Brass & Copper Co., Erie, Pa.
 Republic Steel Corp., Cleveland, Ohio
 Revere Brass Co., Inc., New York, N. Y.
 United Wire & Supply Co.
 Providence, R. I.
 Wolverine Tube Co., Detroit, Mich.

PREST-O-LITE

Trade-Mark

HALIDE LEAK DETECTOR



The *Prest-O-Lite* Halide Leak Detector is a positive, sensitive device for locating leaks of non-combustible halide gases in refrigerating and air-conditioning units. These gases—such as F-12 (Freon), F-21, F-114 and Carrene—are relatively odorless, tasteless and colorless, properties which render necessary a quick, sure method of locating leaks.

Ask your jobber or any Linde office for a demonstration and descriptive folder.

THE LINDE AIR PRODUCTS COMPANY
 Unit of Union Carbide and Carbon Corporation

UCC

New York and Principal Cities
 In Canada: Dominion Oxygen Company, Limited, Toronto

FEATURES

- 1 Assures instant reaction to any concentration of refrigerant gases.
- 2 No preheating, pumping or priming required.
- 3 Economical to use. Need not be lighted until actual testing begins.
- 4 Two-color flame variation gives visible indication of amount of gases.
- 5 Quick clearing of flame after exposure to leaks.
- 6 Reaches easily into inaccessible places.
- 7 Readily portable—ideal for service work.

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American Radiator Co., New York, N. Y.

Bridgeport Brass Co., Bridgeport, Conn.

Frick Co., Waynesboro, Pa.

Mueller Brass Co., Port Huron, Mich.

National Copper & Smelting Co.
Cleveland, Ohio

Penn Brass & Copper Co., Erie, Pa.

Revere Brass Co., Inc., New York, N. Y.

United Wire & Supply Co.
Providence, R. I.

Wolverine Tube Co., Detroit, Mich.

Dependable Products For Every Need of the Refrigeration and Air Conditioning Trade

- WIRE SOLDERS (all alloys and gauges) . . . BAR SOLDERS (all mixtures and shapes) . . . ACID-CORE and ROSIN-CORE SOLDERS . . . WHITE METAL ALLOYS FOR MOST EVERY PURPOSE . . . LEAD, TIN, ZINC, BABBITTS, CASTING and DIPPING METALS, ETC.

Consult Us On Your Problems



4830 S. Campbell Ave., Chicago, Ill.
Established for over 36 Years.

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Bridgeport Brass Co., Bridgeport, Conn.

Chase Brass & Copper Co., Inc.
Waterbury, Conn.

Imperial Brass Mfg. Co., Chicago, Ill.

Linderme Tube Co., Cleveland, Ohio

Mueller Brass Co., Port Huron, Mich.

National Copper & Smelting Co.
Cleveland, Ohio

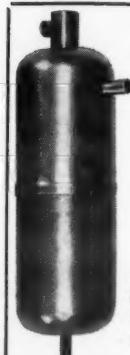
Penn Brass & Copper Co., Erie, Pa.

Revere Brass Co., Inc., New York, N. Y.

Summerill Tubing Co., Bridgeport, Pa.

United Wire & Supply Co.
Providence, R. I.

Wolverine Tube Co., Detroit, Mich.



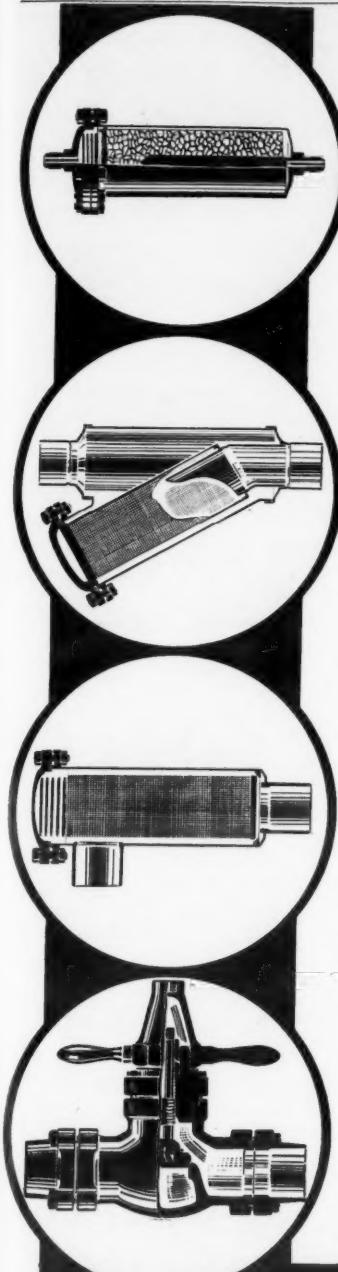
RECEIVER TANKS—COMPRESSOR BASES—MOTOR MOUNTING BASES — AND OTHER STAMPINGS AND ASSEMBLIES FOR REFRIGERATION AND AIR CONDITIONING.

Our Receiver Tanks are made with drawn shells. Assembly by Hydrogen Brazing produces tanks chemically clean and free from dirt. Can furnish tanks painted if desired.

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Controlled
Atmosphere

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THE ACKLIN STAMPING CO.
TOLEDO, OHIO
Chicago, Ill.
Detroit, 2-165 Gen. Motors Bldg.



DRYERS, STRAINERS and large line VALVES



Only Henry Offers a Size and Type
for Every Need

The ever widening application of air conditioning and refrigeration has only emphasized the need for equipment, which through design and experience best meets the needs of any particular installation.

Henry makes the most complete line of dryers, strainers and large line valves in which are incorporated advanced engineering design. With a wide choice of sizes and types, it is easier to select the particular product that best meets the requirements of any refrigeration or air conditioning installation.

Also manufacturers of ammonia valves, fittings, accessories and service tools. Write for catalog.



HENRY VALVE CO.

1001-19 N. Spaulding Ave., Chicago, Ill.

Stocked and Sold by Leading Jobbers

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HENRY

Valves and Fittings

Pressure Relief Valves

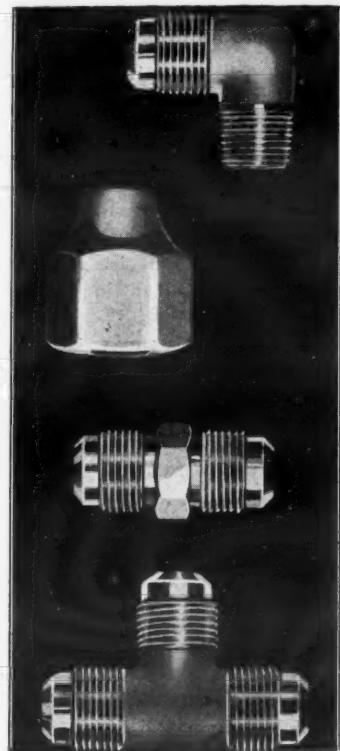
Ashton Valve Co., Cambridge, Mass.
 Henry Valve Co., Chicago, Ill.
 Imperial Brass Mfg. Co., Chicago, Ill.
 Kerotest Mfg. Co., Pittsburgh, Pa.
 Mueller Brass Co., Port Huron, Mich.

Refrigerant Check Valves

Baker Ice Machine Co., Omaha, Nebr.
 Fedders Mfg. Co., Buffalo, N. Y.
 Henry Valve Co., Chicago, Ill.
 Imperial Brass Mfg. Co., Chicago, Ill.
 Kerotest Mfg. Co., Pittsburgh, Pa.

Refrigerant Fittings

American Brass Co., Waterbury, Conn.
 American Injector Co., Detroit, Mich.
 American Radiator Co., New York, N. Y.
 Chase Brass & Copper Co., Inc.
 Waterbury, Conn.
 Commonwealth Brass Corp., Detroit, Mich.
 Henry Valve Co., Chicago, Ill.
 Imperial Brass Mfg. Co., Chicago, Ill.
 Kerotest Mfg. Co., Pittsburgh, Pa.
 Mueller Brass Co., Port Huron, Mich.
 Weatherhead Co., Cleveland, Ohio



Seepage-Proof FITTINGS

"Built Right to Stay Tight"

Every style and size of forged flared tube fitting for the refrigeration industry is available from standard stock at Commonwealth.

Thousands of semi-standard patterns enable us to quickly furnish any desired variation in pipe and tube ends.

Special fittings made to order.

Commonwealth fittings are correctly designed, carefully machined, and tube seats are protected in shipping.

25 years of service to the industry.

**COMMONWEALTH
BRASS CORPORATION**

Commonwealth at Grand Trunk R. R.
 DETROIT, MICH.

Refrigerant Line and Manifold Valves

Henry Valve Co., Chicago, Ill.
 Imperial Brass Mfg. Co., Chicago, Ill.
 Kerotest Mfg. Co., Pittsburgh, Pa.
 Mueller Brass Co., Port Huron, Mich.
 Weatherhead Co., Cleveland, Ohio

Minneapolis-Honeywell Regulator Co.
 Minneapolis, Minn.

Supreme Electric Products Corp.
 Rochester, N. Y.

Refrigerant Shut-off Valves

American Injector Co., Detroit, Mich.
 Henry Valve Co., Chicago, Ill.
 Imperial Brass Mfg. Co., Chicago, Ill.
 Kerotest Mfg. Co., Pittsburgh, Pa.
 Mueller Brass Co., Port Huron, Mich.
 Weatherhead Co., Cleveland, Ohio

Thermostatic Expansion Valves

Alco Valve Co., St. Louis, Mo.
 American Injector Co., Detroit, Mich.
 Automatic Products Co., Milwaukee, Wis.
 Detroit Lubricator Co., Detroit, Mich.
 Fedders Mfg. Co., Buffalo, N. Y.
 Peerless of America, Inc., Chicago, Ill.
 Spoehr-Lange Co., St. Louis, Mo.

Refrigerant Solenoid Valves

Automatic Products Co., Milwaukee, Wis.
 Barber-Colman Co., Rockford, Ill.
 Detroit Lubricator Co., Detroit, Mich.
 Electrimatic Corp., Chicago, Ill.
 General Controls Co., San Francisco, Calif.
 Mercoid Corp., Chicago, Ill.

Water Regulating Valves

American Injector Co., Detroit, Mich.
 Art Valve Co., Chicago, Ill.
 Automatic Products Co., Milwaukee, Wis.
 Barber-Colman Co., Rockford, Ill.
 Electrimatic Corp., Chicago, Ill.
 Penn Electric Switch Co.
 Des Moines, Iowa
 Perfection Parts Co., Harvey, Ill.
 Tagliabue Mfg. Co., C. J., Brooklyn, N. Y.

WEATHERHEAD MANIFOLDS

- Welded steel in construction for greater strength.
- Bosses full threaded to hold valves without solder.
- All parts completely tin plated.
- Made in two to ten valve units with two valve spacings.

GENUINE WEATHERHEAD REFRIGERATION PARTS

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